

PHILIPS DELLP1230 SERVICE MANUAL



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Service

DELLP1230



6L3P10/76

Service Manual

Horizontal frequencies
30 - 130 kHz

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SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

飛利浦



PHILIPS

IMPORTANT SAFETY NOTICE

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Proper service and repair is important to the safe, reliable operation of all DELL Company** Equipment. The service procedures recommended by DELL and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully Read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper Service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. DELL could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, DELL has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by DELL must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

* * Hereafter throughout this manual, DELL Company Will be referred to as DELL.

WARNING

Critical components having special safety characteristics are identified with a  by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol  on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from DELL. DELL assumes no liability, express or implied, arising out of any unauthorized modification Of design.
Servicer assumes all liability.



* Broken Line

FOR PRODUCTS CONTAINING LASER :

- DANGER- Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.
- CAUTION- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- CAUTION- The use of optical instruments with this product will increase eye hazard.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

Specification

Type NR M LVT X A Mitsubishi NF U

Dimensions : 22" NF

Phosphor Pitch (mm) : 0.24 (at center)

Mask : AG

Deflection angle : 90 deg

Light transmission

Surface of plate Sputter coating

Phosphor : B22

Horizontal scan : 30 - 130 KHz

Vertical scan : 50 - 160 Hz

Input signals

Video : 0.7 Vp-p Linear / 75 ohms

Sync : H/H+V, V TTL level, composite sync
Analog SOG Sync On Green for models with SOG function.

Impedance

Video : Terminated with 75 ohms

Sync : Terminated with 2K2 ohms

Power supply

Main voltage : AC 90 - 264 Vrms, 47 - 63 Hz

Power consumption : 125 Watts (typical)

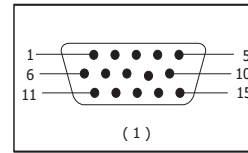
Power cord length : 1.8M

Power cord type : 3 lead with earth plug, detachable

Power indicator : LED (2 colors green, amber).

Auto power saving : Fulfill TCO99 , EPA and E2000 Requirements

Pin assignment :



The 15-pin D-sub connector(male) of the signal cable :

Pin No.	Assignment	Pin No.	Assignment
1	Red video input	9	PC +5V for DDC
2	Green video input	10	Ground
3	Blue video input	11	Ground
4	Ground	12	Bi-directional data(SDA)
5	Self test	13	H.Sync
6	Red video ground	14	V.Sync
7	Green video ground	15	DDC Data CLOCK (SCL)
8	Blue video ground		

Data Storage

Factory preset mode:

This monitor has 8 factory-preset modes as indicated in the following table :

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (Horizontal / Vertical)
VESA, 640 x 480	31.5	59.9	25.2	-/-
VESA, 640 x 480	43.3	85.0	36.0	-/-
VESA, 800 x 600	53.7	85.1	56.3	+/+
VESA, 1024 x 768	60.0	75.0	78.8	+/+
VESA, 1024 x 768	68.7	85.0	94.5	+/+
VESA, 1280 x 1024	80.0	75.0	135	+/+
VESA, 1280 x 1024	91.1	85.0	157.5	+/+
VESA, 1600 x 1200	93.8	75.0	202.5	+/+
VESA, 1600 x 1200	106.3	85.0	229.5	+/+

Mode	H, V	Video	power consumption	LED colors
ON	1 1	1	Typical 115W	Green
OFF	0 1	X	<1Watts	Amber
OFF	1 0	X	<1Watts	Amber
OFF	0 0	X	<1Watts	Amber

X : Video blanked.

Dimensions	Width: Depth: Height:	512.8 mm (20.19 in.) 483.6 mm (19.04 in.) 516.4 mm (20.33 in.)
Weight	With Packaging: Without Packaging:	35.5 kg (78.19 lb) 30.5 kg (67.18 lb)
Tilt Swivel	Forward tilt: Backward tilt: Swivel:	5 15 +90 /-90
Image	Maximum Height: Maximum Width: Dot Pitch:	304.80 mm (12.00 in.) 406.44 mm (16.00 in.) 0.24 mm (0.0094 in.)
Power Input	Supply Voltage: Max Supply Current:	90-264 V ac, 47-63 Hz 1.8A at 100 V ac
Video Input	Input Signal: Horiz. Addressability: Vert. Addressability: Clock Rate	Analog Direct Drive, 75 ohm 0-0.7 V 2048 pels (maximum) 1536 lines (maximum) 360 MHz
Communications	VESA DDC	2B
Synchronization Range	Horiz. Frequency: Vert. Frequency:	30 kHz-130 kHz 50 Hz-160 Hz
Power Consumption (Typical)	Normal Operation: Off:	<130 W <1 W
Environment	Operating Temperature: Storage Temperature: Shipping Temperature: Operating Humidity: Storage Humidity: Shipping Humidity: Emissions:	0 to 35 C (32 to 95 F) -25 to 65 C (-13 to 149 F) -25 to 65 C (-13 to 149 F) 10 to 90 % 5 to 95 % 5 to 95 % TCO 03/TCO 99

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Front View



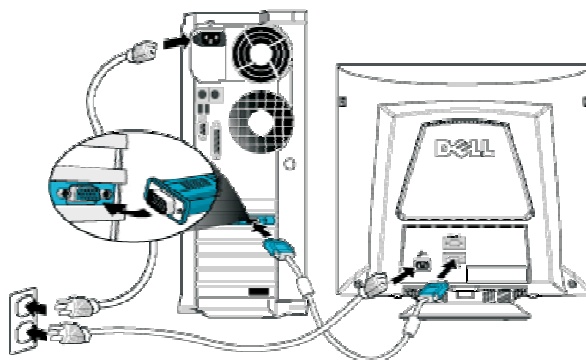
Note: The color of the monitor may vary

1. Power button-Switches your monitor on
2. Power indicator-This light glows green during normal operation and glows amber when in the power saving mode.
3. Menu button-Activates the Main OSD menu controls.
4. Contrast hotkeys - Pressing the UP button will access the contrast menu (CONTRAST control bar will appear on screen)
5. Brightness hotkeys - Pressing the Down button will access brightness menu. (BRIGHTNESS control bar will appear on screen).
6. These are also used for adjusting other functions in the Main OSD Menu of your monitor.



1. Power port
2. D-SUB graphics port 1 & 2. (Connector)

Cable Connections On Back of Monitor and Computer



1. Turn off your computer and unplug its power cord.
2. Connect the blue connector of the signal cable to the blue graphics port on the back of your computer. Tighten thumb screws finger tight only. Do not over tighten.
3. Connect the other end of the signal cable to the graphic port 1 or 2 on the back of the monitor.
4. Fully insert the monitor's power cord into the power port on the back of the monitor.
5. Plug the power cords of your computer and your monitor into a nearby outlet.
6. Turn on your monitor and computer.

OSD menu tree

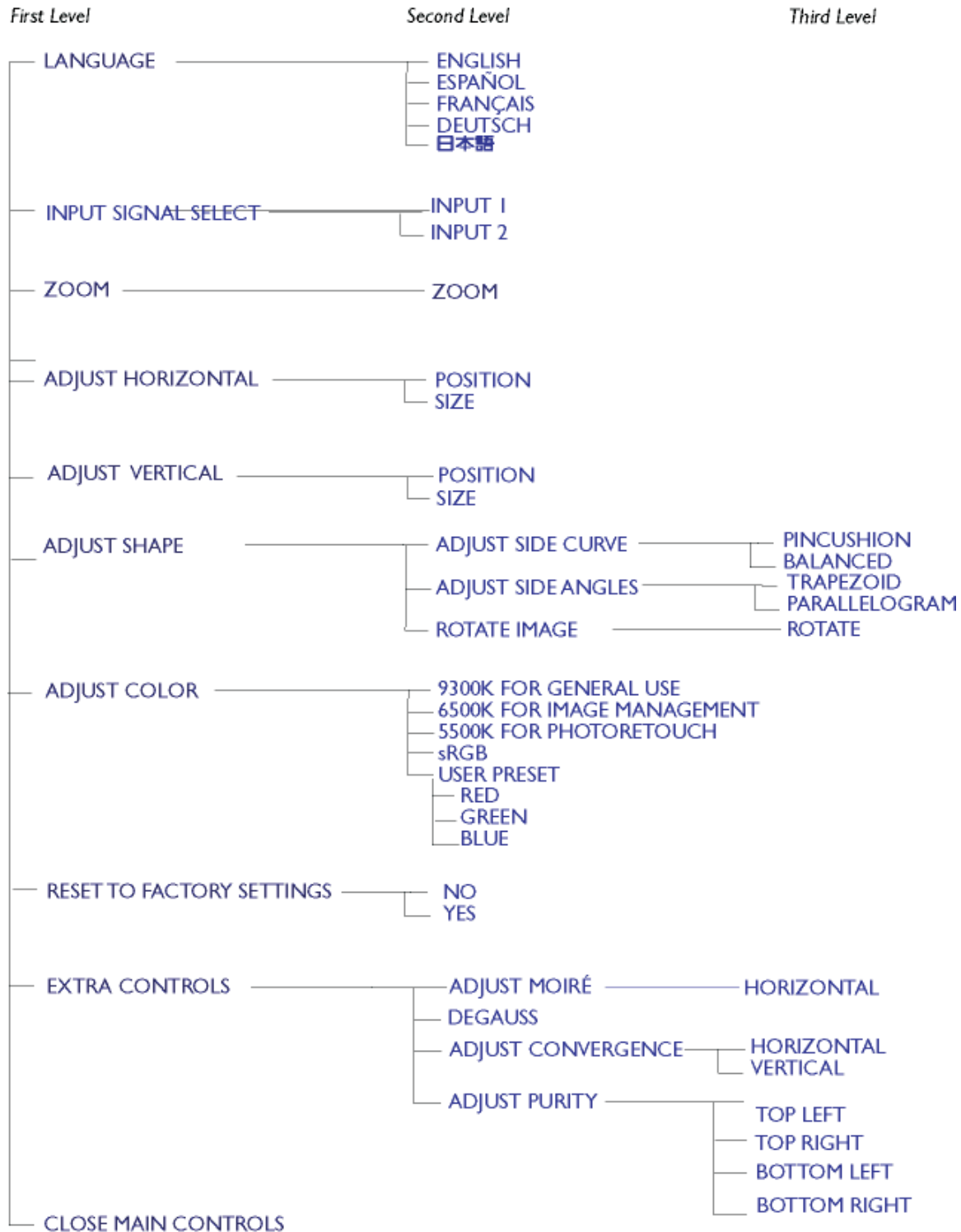
DELL P1230 M25P

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The OSD Tree

Below is an overall view of the structure of the On-screen Display. You can use this as reference when you want to later on work your way around the different adjustments.



Lock/Unlock, Burn in, Service Mode

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OSD Lock

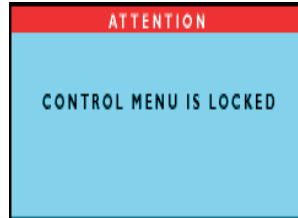
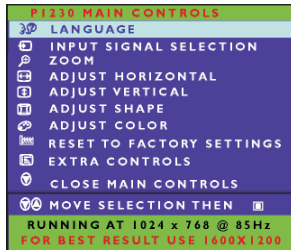
OSD lock is a feature which disables the OSD controls. It can be used when the monitor is set up for demonstration purposes or when adjustment of the OSD is not desirable.

Switch on OSD lock feature:

Press and hold the  button continuously for 15 seconds.

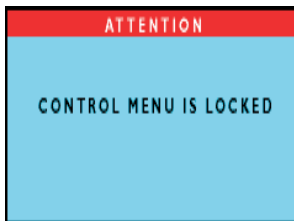
Release the button when the message

"CONTROL MENU IS LOCKED" appears



Switch off OSD lock feature:

Press and hold the  button continuously for 15 seconds or until the message window "CONTROL MENU IS LOCKED" disappears, and "MAIN CONTROL" appears.



Default setting of MODEL SELECT (Do not change it.)

MODEL SELECT			
	DELL P1230	U3	168
	DELL P1230	U3V. 1	255
	RESERVE		
	RESERVE		
	RESERVE		
	SWDDC		

To leave factory mode

7. After alignment of factory mode. Turn off monitor (if you do not turn off the monitor. The OSD menu is always at the factory mode). then turn monitor again (at this moment, the OSD menu goes back to user mode).

To access BURN IN mode

First of all, monitor displays an image.

1. Disconnect the video cable (interface cable).

2. Turn off monitor

3. Press  and  simultaneously on the front control panel, then the BURN IN mode comes on the screen of monitor as below.

50 seconds around



5 seconds around



repeatedly

4. Reconnect the video cable, the return to normal image.

SERVICE MODE (Indication-Factory mode)



01379 stands for
1. using 1379 hours already.
2. turn on/off 1379 times.
3. using several hours
+ turn on/off monitor.

To access factory mode

1. Turn off monitor (do not turn off PC)

2. Press  and  simultaneously on the front control panel, then press , wait till the OSD menu with characters DELL P1230 VO.15 20031119 (below OSD menu) come on the screen of monitor.



3. If OSD menu disappears on the screen of monitor, press  again (anytime), then the OSD menu comes on the screen again.

4. Using  and  to select OSD menu.

5. Using  and  to increase or decrease the setting.

6. Using  to access/confirm the selection

Common Problems

The following table contains general information about common monitor problems you might encounter.

COMMON SYMPTOMS	WHAT YOU SEE	POSSIBLE SOLUTIONS
No Video/LED off	No picture, monitor's dead.	● Check connection integrity ● Verify the AC outlet ● Ensure power button depressed fully
No Video/LED on	No picture or no brightness, power LED has green color	● Increase brightness & contrast controls ● Perform monitor Self test feature check ● Check signal cable for bent or broken pins
No Video / LED amber	No picture, power LED has amber color.	● Check that the PC power is plugged in and turned on. ● Check that signal cable is firmly attached to the video port of the PC (blue coded video port). ● Make sure the correct input port (1or 2) is selected. ● Press a key on the PC keyboard or move the mouse to wake up the PC.
"No signal input from input 1 or 2" appears	A RGB box with the message "No signal input from input 1 or 2" shows on screen.	● Check the signal cable connection between computer and monitor. ● Use the monitor Self test feature described under trouble shooting.
"Frequency out of range" appears	A red and cyan colored box with the message "Frequency out of range" appears on screen.	● Wait 15 seconds for Windows to reset video mode. ● Manually reset video mode by following procedure: ○ Reboot PC. ○ Press F8 while reboot is processing. ○ Select safe mode. ○ Select Control Panel to decrease resolution.
Poor Focus	Picture is fuzzy, blurry or ghosting	● Eliminate video extension cables. ● Perform monitor reset (Select "Reset" in main menu). ● Select "Moiré" from advanced controls and set H & V Moiré at 0%. ● Decrease brightness & contrast controls ● Lower video resolution or increase font size.
Shaky/Jittery Video	Wavy picture or fine movement	● Perform monitor "Reset" ● Check environmental factors ● Relocate and test in other room
Color Purity Problems	Color is not uniform Picture has color blotches or shades	● Activate the Degauss feature using the OSD degauss menu. ● Reposition the monitor. ● Check environmental factors (Speakers too close to monitor). ● Adjust the purity by using the OSD "ADJUST PURITY" in "EXTRA CONTROLS" menu.
Color Convergence Problems	Characters show red or blue at edges	● Perform monitor reset (Select "Reset" in main menu). ● Perform monitor Degauss. ● Adjust the convergence by using the OSD "ADJUST CONVERGENCE" in EXTRA CONTROLS.
Missing Color or Color Flood	Entire screen is purple or yellow Entire screen is red, green or blue	● Check that signal cable is firmly attached to the video port of the PC (blue coded video port). ● Perform monitor reset (Select "Reset" in main menu) ● Perform monitor Self test feature. ● Check signal cable for bent or broken pins. ● Reset the video card
Missing Pixels	CRT screen has spots, specs or blemishes on the glass	● If the blemish is on the outside of the glass, try cleaning the CRT screen

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Common problems

The following table contains general information about common monitor problems you might encounter

Brightness Problems	Picture too dim or too bright	● Perform monitor "Reset" ● Adjust brightness & contrast controls
Geometric Distortion	Screen not sized or centered correctly	● Perform monitor "Reset" ● Ensure monitor is in proper video mode ● Adjust the appropriate geometric control
Moiré (Thin Curvy Lines)	Screen shows wavy or elliptical lines Screen shows wood grain patterns	● Ensure monitor is in proper video mode ● Adjust horizontal or vertical size Clear the moiré pattern by using the OSD "Moiré" menu in "extra controls" menu. ● Explanation of Moiré patterns.
Audible Noise Problems	Has humming sound or high frequency squeal	● Ensure monitor is in proper video mode ● Reposition the monitor ● A loud hum when turning on or during manual degaussing is normal
CRT Scratched	Screen has scratches or smudges	● Turn monitor off and clean the screen, see Maintenance instructions
Safety Related Issues	Visible signs of smoke or sparks	● Do not perform any troubleshooting steps ● Switch off the monitor and disconnect the mains cord. ● The monitor needs to be replaced.
Intermittent Problems	Monitor malfunctions on & off	● Check connection integrity of mains cables. ● Check the signal cable connection between computer and monitor. ● Ensure monitor is in proper video mode. ● Perform monitor "Reset" ● Use the monitor Self test feature described under trouble shooting.

- 0. Location of the panel
- 0.1 Main panel (1160)
- 0.2 Video panel (1161)

1. General

To be able to perform measurements and repairs on the "circuit boards", the monitor should be placed in Service Position (fig. 1) first:

How to remove the back cover of monitor :

There are 2 screws in the lid [1 screw are at the right side of the monitor, The other 1 screw are at the left side of the monitor], to fix the front cabinet and back cover of the monitor.

- Step 1: To open the lid at the right-upper side and 1screw in right-downer side of the monitor.(FIG.3)
- Step 2: To open the lid at the left-upper side and 1screw in left-downer side of the monitor.(FIG.4)
- Step 3: To remove the back cover, you can see FIG.5
- Step 4: To remove the 13 screws on the metal shield, and remove the metal shield, you can see FIG.6.

Chassis :

- After remove the back cover & metal shield, you can see the inside of the monitor as Fig. 6.
- To remove 13 screws for service position as Fig. 5 to Fig. 8.
- Include remove bottom plate screw, then slide out chassis board and disconnect metal shield.

Video panel :

- After remove the metal frame (Fig. 5), to remove the metal shield on rear side of Video panel for measurement.

Main panel :

After remove the metal frame.

- To cut out cable tie and disconnect "video panel"
- To disconnect EHT cable
- To disconnect ground wire(1703) of video board.
- To disconnect M1311(4pin) to control panel.
- To disconnect M1501(4pin) yoke connector.
- To disconnect M1131(2pin) degaussing coil
- To slide out Main panel as Fig. 1.

Service position :

To get service position as Fig. 1 through Fig. 2 to Fig. 8.

2. Repair instructions

After the service position was obtained, all the panel's copper track side could be accessed.



Fig. 2

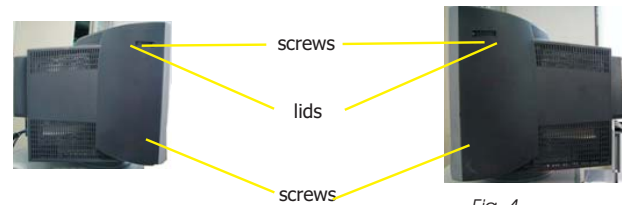


Fig. 3

Fig. 4



Fig. 5



Fig. 6

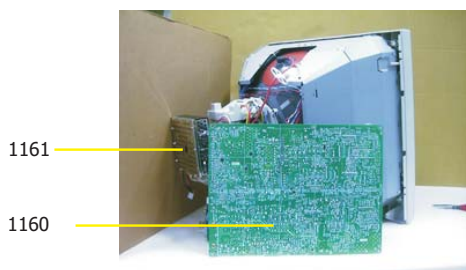


Fig. 1 Service Position

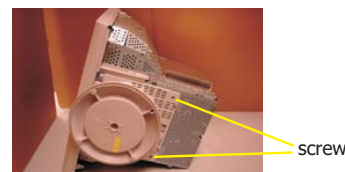
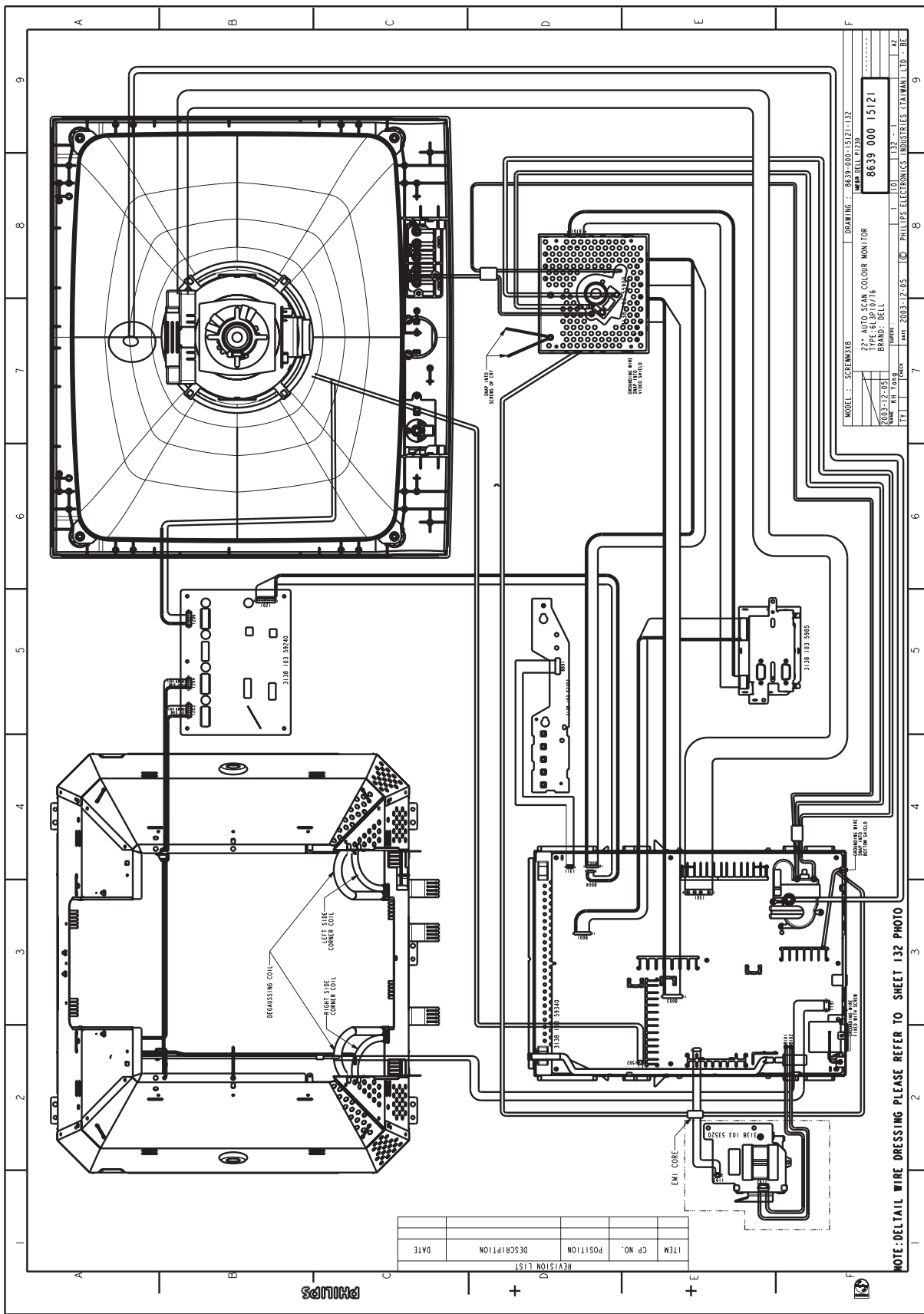


Fig. 7



Fig. 8

Wiring Diagram



EDID log file

Vendor/Product Identification

ID Manufacturer Name : DEL
ID Product Code : 700C (HEX.)
ID Serial Number : 0001 (ASCII.)
Week of Manufacture : 46
Year of Manufacture : 2003

EDID Version, Revision

Version : 1
Revision : 3

Basic Display Parameters/Features

Video Input Definition : Analog Video Input
0.700V/0.000V (0.70Vpp)
without Blank-to-Black Setup
Separate Sync
Composite Sync
Sync on Green
no Serration required

Maximum H Image Size : 41
Maximum V Image Size : 31
Display Transfer Characteristic: 2.72
(gamma)

Feature Support (DPMS) : Standby
Suspend
Active Off

Display Type : RGB color display
Standard Default Color Space: Primary color space
Preferred Timing Mode : Detailed timing block 1
GTF supported : Based on GTF standard

Color Characteristics

Red X coordinate : 0.622
Red Y coordinate : 0.339
Green X coordinate : 0.279
Green Y coordinate : 0.6
Blue X coordinate : 0.149
Blue Y coordinate : 0.072
White X coordinate : 0.283
White Y coordinate : 0.297

Established Timings

Established Timings I : 720 x 400 @70Hz (IBM,VGA)
640 x 480 @60Hz (IBM,VGA)
640 x 480 @75Hz (VESA)
Established Timings II : 800 x 600 @75Hz (VESA)
1024 x 768 @60Hz (VESA)
1024 x 768 @75Hz (VESA)
1280 x 1024 @75Hz (VESA)

Manufacturer's timings :

Standard Timing Identification #1

Horizontal active pixels : 640
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #2

Horizontal active pixels : 800
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #3

Horizontal active pixels : 1024
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #4

Horizontal active pixels : 1280
Aspect Ratio : 5:4
Refresh Rate : 85

Standard Timing Identification #5

Horizontal active pixels : 1600
Aspect Ratio : 4:3
Refresh Rate : 75

Standard Timing Identification #6

Horizontal active pixels : 1600
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #7

Horizontal active pixels : 1920
Aspect Ratio : 4:3
Refresh Rate : 75

Standard Timing Identification #8

Horizontal active pixels : 1920
Aspect Ratio : 4:3
Refresh Rate : 85

Detailed Timing #1

Pixel Clock (MHz) : 202.5
H Active (pixels) : 1600
H Blanking (pixels) : 560
V Active (lines) : 1200
V Blanking (lines) : 50
H Sync Offset (F Porch) (pixels): 64
H Sync Pulse Width (pixels): 192
V Sync Offset (F Porch) (lines): 1
V Sync Pulse Width (lines) : 3
H Image Size (mm) : 392
V Image Size (mm) : 294
H Border (pixels) : 0
V Border (lines) : 0
Flags : Non-interlaced
: Normal Display, No stereo
: Digital Separate sync.
: Positive Vertical Sync.
: Positive Horizontal Sync.

Monitor Descriptor #2

Serial Number : R35114290001

Monitor Descriptor #3

Monitor Name : DELL P1230

Monitor Descriptor #4

Monitor Range Limits
Min. Vt rate Hz : 50
Max. Vt rate Hz : 160
Min. Horiz. rate kHz : 30
Max. Horiz. rate kHz : 130
Max. Supported Pixel : 370

No secondary GTF timing formula supported.

Extension Flag : 0

Check sum : E8 (HEX.)

EDID data (128 bytes)

0: 00 1: ff 2: ff 3: ff 4: ff 5: ff 6: ff 7: 00
8: 10 9: ac 10: 0c 11: 70 12: 31 13: 30 14: 30 15: 30
16: 2e 17: 0d 18: 01 19: 03 20: 6e 21: 29 22: 1f 23: ac
24: ef 25: 7a 26: 68 27: 9f 28: 56 29: 47 30: 99 31: 26
32: 12 33: 48 34: 4c 35: a4 36: 4b 37: 00 38: 31 39: 59
40: 45 41: 59 42: 61 43: 59 44: 81 45: 99 46: a9 47: 4f
48: a9 49: 59 50: d1 51: 4f 52: d1 53: 59 54: 1a 55: 4f
56: 40 57: 30 58: 62 59: b0 60: 32 61: 40 62: 40 63: c0
64: 13 65: 00 66: 88 67: 26 68: 11 69: 00 70: 00 71: 1e
72: 00 73: 00 74: 00 75: ff 76: 00 77: 52 78: 33 79: 35
80: 31 81: 31 82: 34 83: 32 84: 39 85: 30 86: 30 87: 30
88: 31 89: 0a 90: 00 91: 00 92: 00 93: fc 94: 00 95: 44
96: 45 97: 4c 98: 4c 99: 20 100: 20 101: 50 102: 31 103: 32
104: 33 105: 30 106: 20 107: 20 108: 00 109: 00 110: 00 111: fd
112: 00 113: 32 114: a0 115: 1e 116: 82 117: 25 118: 00 119: 0a
120: 20 121: 20 122: 20 123: 20 124: 20 125: 20 126: 00 127: e8

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1. General

DDC Data Re-programming

In case the main EEPROM with Software DDC which store all factory settings were replaced because a defect, repaired monitor the serial numbers have to be re-programmed.

It is advised to re-solder the main EEPROM with Software DDC from the old board onto the new board if circuit board have been replaced, in this case the DDC data does not need to be re-programmed.

Additional information

Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA). Extended Display Identification Data(EDID) information may be also obtained from VESA.

DDC EDID structure

For the monitor : Standard Version 3.0
Structure Version 1.3

2. System and equipment requirements

1. An i486 (or above) personal computer or compatible.
 2. Microsoft operation system Windows 95/98.
 3. EDID301.EXE program (3138 106 10103) shown as Fig. 1
 4. Software DDC Alignment kits (4822 310 11184) shown as Fig. 2.
- The kit contents: a. Alignment box x1
b. Printer cable x1
c. D-Sub cable x1

Note: The EDID301.EXE (Release Version 1.58, 20000818) is a windows-based program, which cannot be run in MS-DOS.

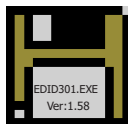


Figure 1 Diskette with EDID301.EXE

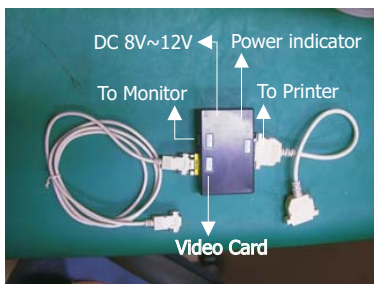
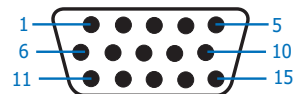


Fig. 2 Alignment Kits

3. Pin assignment

A. 15-pin D-Sub Connector

The 15-pin D-sub connector (male) of the signal cable on the 3rd row for DDC feature :



Pin No.	Assignment	Pin No.	Assignment
1	Red video input	9	PC + 5V for DDC
2	Green video input	10	Ground
3	Blue video input	11	Ground
4	Ground	12	Bi-directional data(SDA)
5	Self-test	13	H.Sync
6	Red video ground	14	V.Sync
7	Green video ground	15	DDC Data clock(SCL)
8	Blue video ground		

4. Configuration and procedure

There is no Hardware DDC (DDC IC) anymore. Main EEPROM stores all factory settings and DDC data (EDID code) which is so called Software DDC. The following section describes the connection and procedure for Software DDC application. The main EEPROM can be re-programmed by enabling "factory memory data write" function on the DDC program (EDID301.EXE).

*** INITIALIZE ALIGNMENT BOX ***

In order to avoid that monitor entering power saving mode due to sync will cut off by alignment box, it is necessary to initialize alignment box before re-programming DDC Data. Following steps show you the procedures and connection.

- Step 1: Supply 8~12V DC power source to the Alignment box by plugging a DC power cord or using batteries.
 Step 2: Connecting printer cable and video cable of monitor as shown in Fig.3.

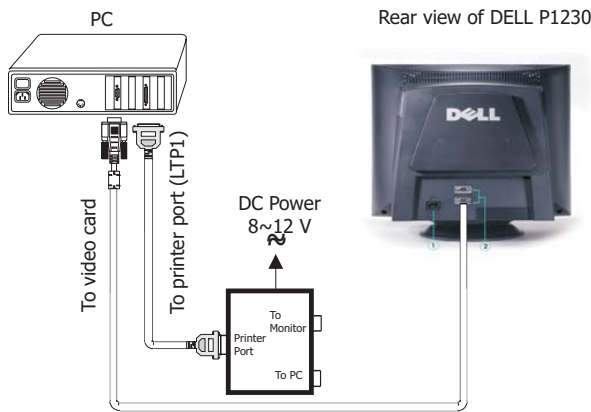


Fig. 3

Step 3: Installation of EDID301.EXE

Method 1: Start on DDC program

Start Microsoft Windows.

1. Insert the disk containing EDID301.EXE program into floppy disk drive.
2. Click Start, choose Run at start menu of Windows 95/98 as shown in Fig. 4.

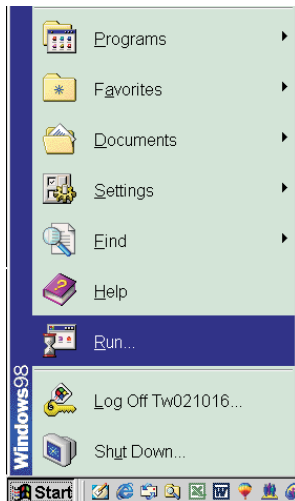


Fig. 4

3. At the submenu, type the letter of your computer's floppy disk drive followed by :EDID301 (for example, A:\EDID301, as shown in Fig. 5).

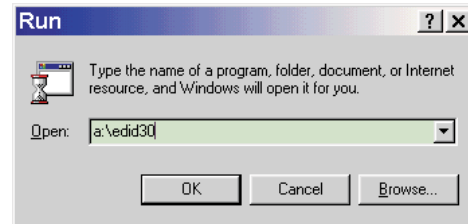


Fig. 5

4. Click OK button. The main menu appears (as shown in Fig. 6). This is for initialize alignment box.

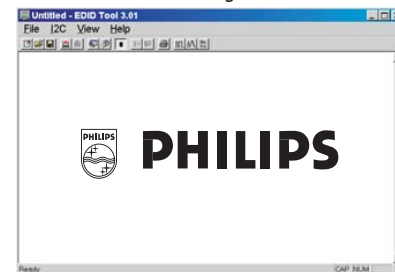


Fig. 6

Note 1: If the connection is improper, you will see the following error message (as shown in Fig. 7) before entering the main menu. Meanwhile, the (read EDID) function will be disable. At this time, please make sure all cables are connected correctly and fixedly,

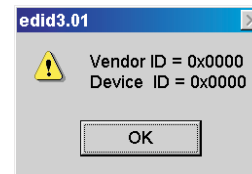


Fig. 7

- Method 2: After create a shortcut of EDID301.EXE
 : Double click EDID301 icon (as shown in Fig. 8) which is on the screen of Windows Wallpaper. Bring up main menu of EDID301 as shown in Fig. 9.



Fig. 8

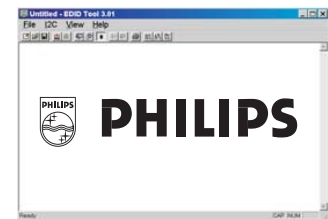
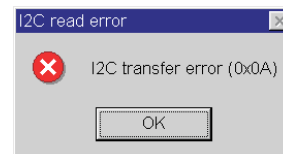


Fig. 9

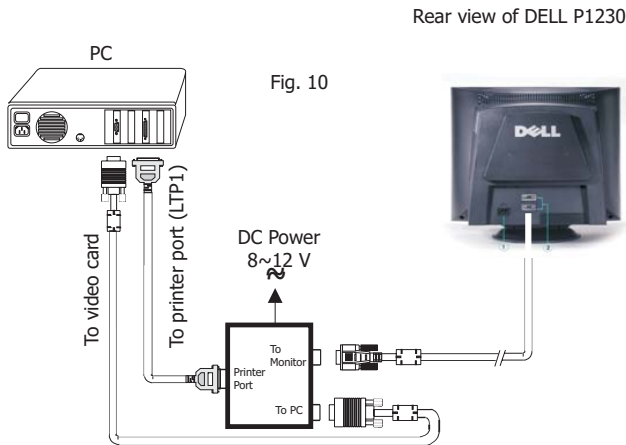
- Note 2: During the loading, EDID301 will verify the EDID data which just loaded from monitor before proceed any further function, once the data structure of EDID can not be recognized, the following error message will appear on the screen as below. Please confirm following steps to avoid this message.
1. The data structure of EDID was incorrect.
 2. DDC IC that you are trying to load data is empty.
 3. Wrong communication channel has set at configuration setup



◀◀ Go to cover page

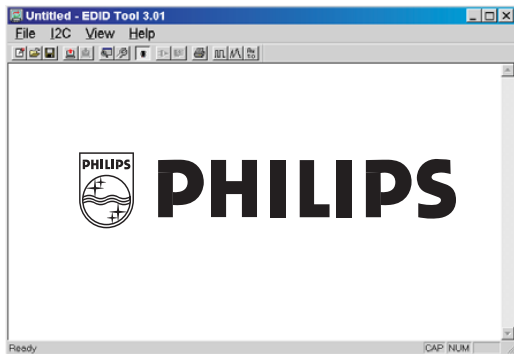
Re-programming EEPROM (Software DDC)

Step 1: After initialize alignment box, connecting all cables and box as shown in Fig. 10

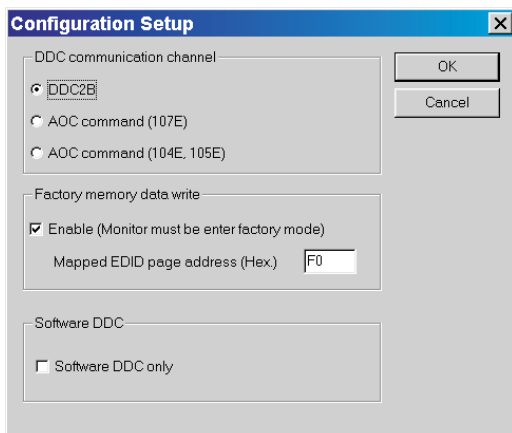


Step 2: Read DDC data from monitor

- 1-1 Click the left key of Mouse, or hit any key on the keyboard, then the characters disappear from the screen.
- 1-2 Click  icon as shown in Fig. 11 from the tool bar to bring up the "Configuration Setup" windows as shown in Fig. 12.

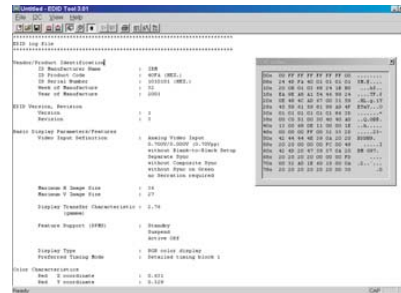


2. Select the DDC2B as the communication channel. Select "Enable" & fill out "F0" for Mapped EDID page address as shown in Fig. 12.



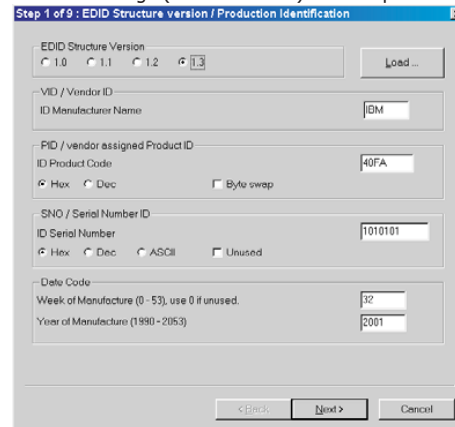
3. Click OK button to confirm the selection.

4. Click  icon (Read EDID function) to read DDC EDID data from monitor. The EDID codes will display on screen as shown in Fig. 13.



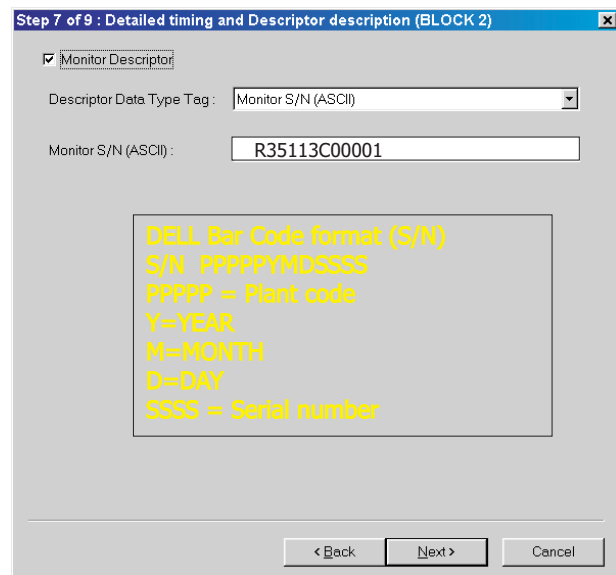
Step 3: Modify DDC data (verify EDID version, week, year)

1. Click  (new function) icon from the tool bar, bring up Step 1 of 9 as shown in Fig. 14. EDID301 DDC application provides the function selection and text change (select & fill out) from Step 1 to Step 9.



Step 4: Modify DDC data (Monitor Serial No.)

1. Click Next till the Step 7 of 9 window appears as shown in Fig. 15.
2. Fill out the new Serial No. (for example, TY 503960, TY 123456).
3. Click Next till the last step window appears, then click Finish to exit the Step window.



Step 5: ****Configuration Setup & Enter Factory Mode ****
for "write EDID data"

1. Click  icon from the tool bar to bring up the Configuration Setup windows again. Then, select "Software DDC only" as shown in

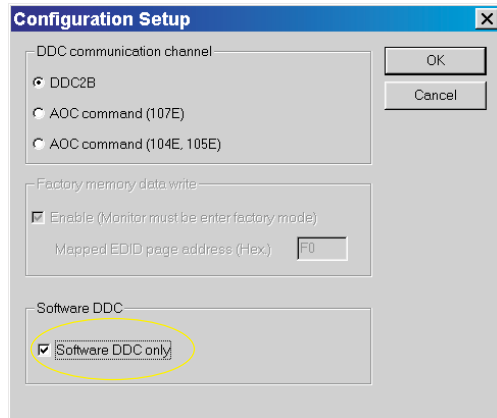


Fig. 16

If you do not select "Software DDC only", when you execute "write EDID", it will bring up an error message as below.



2. Access factory mode

How to get into Factory Mode Menu

Step 1:

Turn off monitor (do not turn off PC)

Step 2:

Press "" and "" simultaneously on the front control panel, then press "" , wait till the OSD menu with characters DELL P1230 VO.15 20031119 (below OSD menu) come on the screen of monitor.



Fig. 17

Factory mode indication

If you do not access "Factory mode", when you execute "write EDID", it will bring up an error message as below.



Step 6: Write DDC data

1. Click  (Write EDID) icon from the tool bar to write DDC data. Bring up "Writing 0%~100%, ready" a progressing bar on the left down corner.
2. Click  (Read EDID) to confirm it.

Step 7: Confirm Serial Number in User Mode

1. Press the power button  to turn off the monitor. Then press it  again to turn on the monitor.
2. Press the OSD button  to bring up the OSD Main Menu.
3. Press the  button to select (INFORMATION), press the  button to confirm your selection/change.
4. Once the Serial Number has been changed, to confirm the change as shown in Fig. 18.



Serial number indication -->

Fig. 18

Step 8: Save DDC data

Sometimes, you may need to save DDC data as a text file for using in other IC chip. To save DDC data, follow the steps below:

1. Click  (Save) icon (or click "file"-> "save as") from the tool bar and give a file name as shown in Fig. 19. The file type is EDID301 file (*.ddc) which can be open in WordPad. By using WordPad, the texts of DDC data & table (128 bytes, hex code) can be modified. If DDC TEXTS & HEX Table are completely correct, it can be saved as .ddc file to re-load it into EEPROM for DDC Data application.

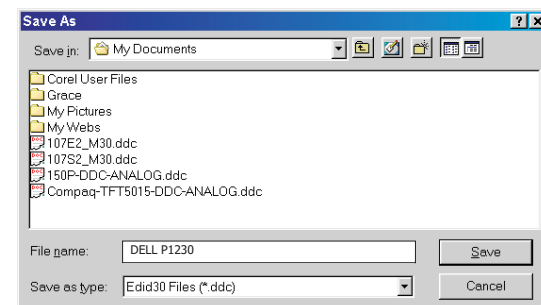


Fig. 19

2. Click Save.

0. General

1. This monitor has 9 factory-preset modes as below.

Display Mode	Horizontal Frequency(kHz)	Vertical Frequency(Hz)	Pixel Clock(MHz)	Sync Polarity (Horizontal/vertical)
VESA 640 x 480	31.5	59.9	25.2	-/-
VESA 640 x 800	43.3	85.0	36.0	-/-
VESA 800 x 600	53.7	85.1	56.3	+/+
VESA 1024 x 768	60.0	75.0	78.8	+/+
VESA 1024 x 768	68.7	85.0	94.5	+/+
VESA 1280 x 1024	80.0	75.0	135	+/+
VESA 1280 x 1024	91.1	85.0	157.5	+/+
VESA 1600 x 1200	93.8	75.0	202.5	+/+
VESA 1600 x 1200	106.3	85.0	229.5	+/+

2. AC/DC Measurement:

The measurements for AC waveform and DC figure is based on 1024 x 768 68.75 kHz/85 Hz resolution mode with test pattern "cross-Hatch" signal.

Adjust BPLUS of factory setting to obtain the anode voltage
25.0KV $\pm$ 0.2KV at zero beam current

3. Monitor the following auxiliary voltages

+ 8.0V SOURCE ACROSS C2362 + 8.0V +/- 0.5 VDC
+ 5.0V SOURCE ACROSS C2143 + 5.0V +/- 0.5 VDC
+ 12.0V SOURCE ACROSS C2361 + 12.0V +/- 0.5 VDC
+ 15.0V SOURCE ACROSS C2134 + 15.1V +/- 1.0 VDC
- 15.0V SOURCE ACROSS C2137 - 15.4V +/- 1.0 VDC
+ 6.3V SOURCE ACROSS D6143 + 6.1V +/- 0.5 VDC
+230.0V SOURCE ACROSS C2131 + 230.0V +/- 0.5 VDC
+ 80.0V SOURCE ACROSS C2133 + 82.0V +/- 2.0 VDC

4. General conditions for alignment

- 4.1 During all alignments, supply a distortion free AC mains voltage to set via an isolating transformer with low internal impedance.
- 4.2 All measurements are carried out at nominal mains voltage, unless otherwise stated.
- 4.3 Align in pre-warmed condition, at least 30 minutes warm-up with nominal picture brightness.
- 4.4 Purity, convergence, geometry and subsequent alignments should be carried out in magnetic cage with correct magnetic field.
Northern hemisphere : H = 0, V = 430mG, Z = 0.
Southern hemisphere : H = 0, V = -520mG, Z = 0.
Equatorial Support : H = 0, V = 0 mG, Z = 0.
- 4.5 All voltages are to be measured or applied with respect to ground, unless otherwise stated.
Note: Do not use heatsink as ground.
- 4.6 Any external voltage sources should have a low internal impedance.
- 4.7 Adjust function controls to center position except for contrast control which should be set to MAX.
- 4.8 The white balance and purity has to be adjusted in sub-dimly lit room.
- 4.9 All alignments have to be done in a room with a temperature of 25 +/- 5 C.
- 4.10 Adjust picture tilt for correct TOP/BOTTOM lines Via I2Cbus. (Picture tube should be mounted without tilt CRT cabinet)
- 4.11 All the alignment can be done only when set is working in 'factory mode' pressing the 'Right (+)' and 'Left (-)' keys together while power on the test set, or by CAA test controller.
Prepare the test set in 'factory mode' before the set alignment.

5. To access factory mode

5.1 Turn off monitor (do not turn off PC)

5.2 Press "⬆" and "⬇" simultaneously on the front control panel, then press "⬇", wait till the OSD menu with characters DELL P1230 VO.15 20031119 (below OSD menu) come on the screen of monitor.



5.3 If OSD menu disappears on the screen of monitor, press "⬇" again (anytime), then the OSD menu comes on the screen again.

5.4 Using "⬇" "⬆" to select OSD menu.

5.5 Using "⬆" "⬇" to increase or decrease the setting.

5.6 Using "⬇" "⬇" to access/confirm the selection

To leave factory mode

5.7 After alignment of factory mode, turn off monitor (if you do not turn off monitor, the OSD menu is always at the factory mode), then turn on monitor again (at this moment, the OSD menu goes back to user mode).

6. Picture geometry setting

- 6.1 Correct the test image to display in parallel with front top plastic bezel by adjusting the Rotate item in OSD Adjust shape. Repeatedly do the adjustments from 6.2 to 6.13 to correct the geometry of this mode and fix the position of horizontal raster on display screen.
- 6.2 Adjust Raster H (in factory mode) to make the horizontal raster symmetrical display at center of the screen.
- 6.3 Adjust the H -Width to 392mm.
- 6.4 Adjust the H-linearity to get optimum horizontal deflection linearity display block to block.
- 6.5 Adjust the H-Phase to center position.
- 6.6 Adjust the side curve □ Pincushion & Balance to get optimum right vertical lines.
- 6.7 Adjust the side angles □ Trapezoid & Parallelogram to get optimum right vertical lines.
- 6.8 Adjust the Corner Top & Bottom to get optimum right vertical lines.
- 6.9 Adjust the Vertical size to 294 mm.
- 6.10 Adjust the vertical linearity to get optimum vertical deflection linearity display block to block.
- 6.11 Adjust the Vertical phase to center.
- 6.12 Repeatedly do the adjustments from 6.3 to 6.11 to optimise the geometry performances and meet the specification (sheet 161) request.
- 6.13 Exit OSD and auto saves the alignment data.
- 6.14 Repeat the procedure of 6.2 - 6.13 to all inspection (preset) & alignment modes listed in the following Factory timing modes table (total 11 modes) until all have been adjusted completely.

7. Alignment of Vg2 cut-off point, white tracking

7.1 External degaussing

7.1.1 Remove ferromagnetic measuring equipment, Iron tablet etc in the neighbourhood of the apparatus within the half meter.

7.1.2 Positioned in the E - W direction (CRT face east), the monitor has to be degaussed by using external degaussing coil.

Remark: The external degaussing coil should be a stick type, can't use ring type for MITSUBISHI NF CRT, and set the electrical current of purity coils (four Corners and N/S) equal to zero, which means the output of PWM 4 to 8 of 7204 (61P4K420WT)

equal to 128, or switch off the monitor before external degaussing.

7.1.3 Slowly increase the distance between the picture tube and degaussing coil, keep the coil in parallel with the screen of CRT when the distance is more than 2 M, then turn off the degaussing current.

7.1.4 Pre-check the purity by using " full RED pattern" Especially

four corners after external degaussing, the user (OSD) control "adjust purity" can be used to optimize the purity performance in pure RED, this action can help to Achieve a correct white tracking adjustment.

7.2

7.2.1

Apply 69KHz/85Hz with full white & 10cm X 10cm white patterns (video as 0.7Vpp)

*Use color analyzer (Minolta CA-100) to adjust cutoff and white uniformity.

Preset (OSD control in the factory mode) following items with initial data (DAC value):

R cut off (BAIS) = 60% , R gain (GAIN) = 70%

G cut off (BAIS) = 60% , G gain (GAIN) = 70% sub contrast (SUB)= 70%

B cut off (BAIS) = 60% , B gain (GAIN) = 70% ABL = 50%

Remark: 100% = 255 steps, 60% = 153 steps, 50% = 128 steps, 70% = 179 steps.

To access factory mode

1. Turn off monitor (do not turn off PC)

2. Press " " and " " simultaneously on the frond control panel, then press " " , wait till the OSD menu with characters DELL P1230 VO.15 20031119 (below OSD menu)" come on the screen of monitor.



Fig. 2.1

3.If OSD menu disappears on the screen of monitor, press " " again (anytime), then the OSD menu comes on the screen again.

4.Using " " to select DELL P1230 VO.15 20031119

5.Using " " to access/confirm the selection

6.Bring up the "function adjustment" as shown in Fig.2.2 Press " " button for function selection as shown in Fig.2.2

Press " " button to access/confirm each item selection

(The cursor indicator will be changed from yellow color to red color Using " " to increase or decrease the value

9300 BIAS	R G B	GAI	N R G B	(For ref. 171, 153, 150, 170, 158, 165)
6500 BIAS	R G B	GAI	N R G B	(For ref. 171, 153, 148, 161, 142, 121)
5500 BIAS	R G B	GAI	N R G B	(For ref. 172, 153, 147, 158, 130, 97)
SRGB BIAS	R G B	GAI	N R G B	(For ref. 171, 153, 148, 140, 120, 100)
FOCUS(H V)	VLINBAL	USER		(For ref. 185, 100, 64)
RASTER(H V)	LIN(H V)	SUB		(For ref. 175, 175, 223, 64)
V(OFFSET GAIN)	SUB			(For ref. 150, 220, 178)
CORNER(T B)	ABL			(For ref. 127 95, 128)
D CONVERGENCE		NS	PURITY	(For ref. 131, 255)
EXIT				

(For example: 171 is value of "BIAS R")

BIAS R G B: R (red) G(green) B(blue) cut off

GAIN R G B: R (red) G(green) B(blue) gain

V FOCUS: Vertical Focus adjustment

H FOCUS: Horizontal Focus adjustment

VLIN BAL: vertical Linearity Balance

USER : Horizontal size range adjustment range

H RASTER: Horizontal raster adjustment

V RASTER: Vertical raster adjustment

H LIN: Horizontal linearity adjustment

V LIN: Vertical linearity adjustment

SUB: " " Zoom range

V OFFSET: Vertical raster center

V GAIN: Vertical size center

SUB : Sub Contrast allowance range

T CORNER: Corner Correction of Top

B CORNER: Corner Correction of BOTTOM

ABL : Auto brightness Limitation

7.2.2 Adjust the cut off of R & B to get 9300K

(X= 0.283 0.006, Y= 0.298 0.006)

and brightness output at reading from 0.06 to 0.07 Ft-L

(may need to readjust the Vg2).

(Apply a signal with 10cm x 10cm white pattern to test set.)*

Keep G cut off with 153

(60%) DAC value during all alignments.

7.2.3 Move the cursor to 9300K R/G/B (GAIN) items.

CPU software will set contrast to maximum when

adjustment OSD cursor stays at GAIN items.

Adjust the gains of R/G/B to get 9300K (x=0.283, y=0.298).

7.2.4 Move the cursor to sub-contrast and adjust the brightness to 35 0.5 Ft

7.2.5 Switch the input signal to full white pattern. Move the OSD

cursor to ABL and adjust the output brightness to 31 0.5 Ft-L.

7.2.6 Repeat 7.2.2, 7.2.5 to get optimal adjustment (white tracking meet requirement 0.015 with respect to center value) and return to main menu. After exit, the OSD will disappear and auto-save the data.

7.2.7 Repeat 7.2.2 to adjust 6500K 'cut off' to meet

(X= 0.313+/- 0.006, Y= 0.329+/- 0.006).

7.2.8 Repeat 7.2.3 to adjust R/G/B 'GAIN' of 6500K to meet

(x= 0.313, y= 0.329) and brightness output

to 31+/- 1 Ft-L.

7.2.9 Repeat 7.2.2 to adjust 5500K 'cut off' to meet

(X= 0.332+/- 0.006, Y= 0.347+/- 0.006).

7.2.10 Repeat 7.2.3 to adjust R/G/B 'GAIN' of 5500K to meet

7.2.11 Repeat 7.2.2 to adjust sRGB 'cut off' to meet (x=

0.313 +/-0.006, y= 0.329 +/- 0.006).

7.2.12 Repeat 7.2.3 to adjust R/G/B 'GAIN' of sRGB to meet

(x=313, y=329) and brightness output to 27+/-1 Ft-L.

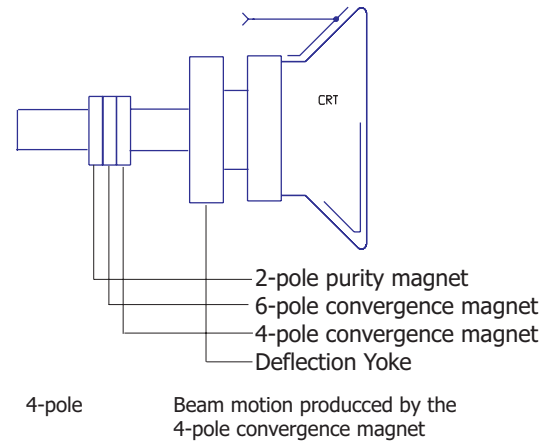
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8. Focus adjustment

- Apply a video signal in the 1280 x1024 with 146kHz/85 Hz mode
- Select " M/E " pattern.
- Set the brightness at center (50%) and the contrast to MAX.-position.
- Adjust focus potentiometers (top of L.O.T.) Focus 1 for horizontal focus and Focus 2 for vertical focus so that the picture at 2/3 of the diagonal lines (from center to four corners) of the displayed screen is as sharp as possible.

9. Loading DDC code

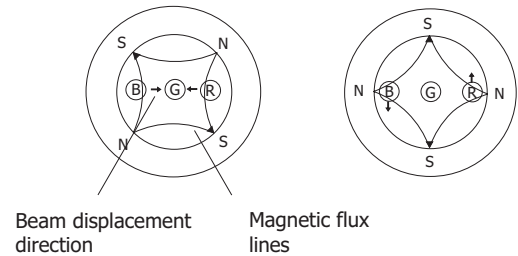
The DDC HEX data should be written into the DDC IC by EEPROM (7804) writer or EDID301.EXE program and Software DDC Alignment Kit.



Purity Adjustment

1. Purity adjustment

- Make sure the monitor is not exposed to any external magnetic field.
- Produce a full red pattern on the screen, adjust the purity magnet rings on the PCM assy (on CRT) to obtain a complete field of the color red. This is done by moving the two tabs (2-pole) in such a manner that they advance in an opposite direction but at the same time to obtain the same angle between the two tabs, which should be approximately 180 degree.
- Check by full green pattern and full blue pattern again to observe their respective color purity.



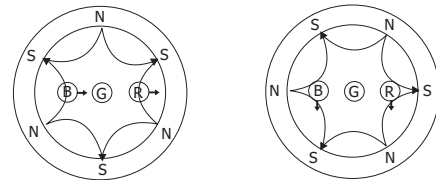
2. Static convergence

Introduction

Slight deviation in the static convergence can be corrected by using two permanent pairs of magnets which are fitted around the neck of the CRT. These are the 4-pole magnet and the 6-pole magnet. The 4-pole magnet move the outermost electron beams (R and B) parallel in the opposite direction from the other. The 6-pole magnet moves the outermost electron beam (R, B and G) parallel in the opposite direction from the other. The magnetic field of the above magnets do not affect the center of the CRT neck.

6-pole

Beam motion produced by the 6-pole convergence magnet



Setting

- Before the static convergence setting can be made, the monitor must be switched on for 30 minutes.
- The focus setting must be made correctly.
- Signal: 640 * 480, 31.5 kHz/60 Hz mode.
- Set the tabs of the 4-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R and B electron beams.
- Set the tabs of the 6-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R, B, and G electron beams.
- First set the 4-pole magnet optimally.
- Then set the 6-pole magnet optimally.
- If the convergence is not now optimal, then adjust to the optimal setting with the 4-pole magnet and then with the 6-Pole magnet again.
- Set the tabs of the 6-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R, B, and G electron beams.
- First set the 4-pole magnet optimally.
- Then set the 6-pole magnet optimally.
- If the convergence is not now optimal, then adjust to the optimal setting with the 4-pole magnet and then

Warnings

1. Safety regulations require that the unit should be returned in its original condition and that components identical to the original components are used. The safety components are indicated by the symbol .
2. In order to prevent damage to ICs and transistors, all high-voltage flash-overs must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 1 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is 0 V (after approximately 30 seconds).
3. ESD 
All ICs and many other semiconductors are sensitive to electrostatic discharges (ESD). Careless handling during repair can drastically shorten their life. Make sure that during repair you are connected by a pulse band with resistance to the same potential as the ground of the unit. Keep components and tools also at this same potential.
4. When repairing a unit, always connect it to the AC Power voltage via an isolating transformer.
5. Be careful when taking measurements in the high-voltage section and on the picture tube panel.
6. It is recommended that safety goggles be worn when replacing the picture tube.
7. When making adjustments, use plastic rather than metal tools. This will prevent any short-circuit or the danger of a circuit becoming unstable.
8. Never replace modules or other components while the unit is switched on.
9. Together with the deflection unit, the picture tube is used as an integrated unit. Adjustment of this unit during repair is not recommended.
10. After repair, the wiring should be fastened in place with the cable clamps.
11. All units that are returned for service or repair must pass the original manufacturer's safety tests.

Notes

1. The direct voltages and waveforms are average voltages. They have been measured using the Service test software and under the following conditions :
 - Mode : 1024*768 (68.75kHz /85Hz)
 - Signal pattern : White pattern
 - Adjust brightness and contrast control for the mechanical mid-position (click position)
2. The picture tube panel has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
3. The semiconductors indicated in the circuit diagram(s) and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

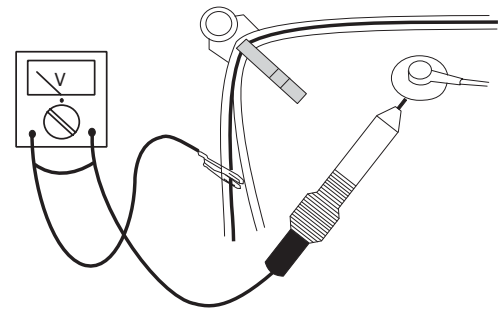
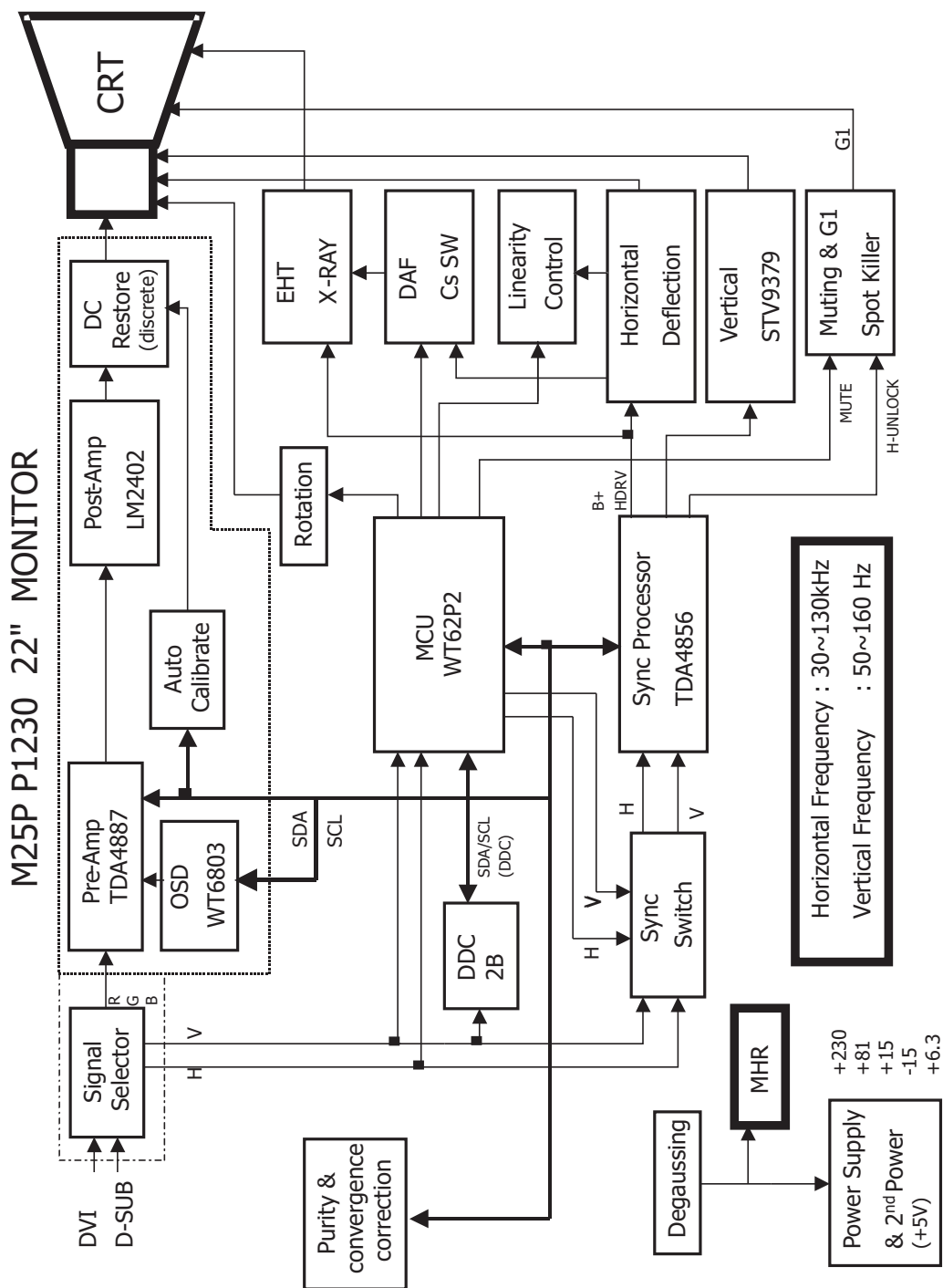
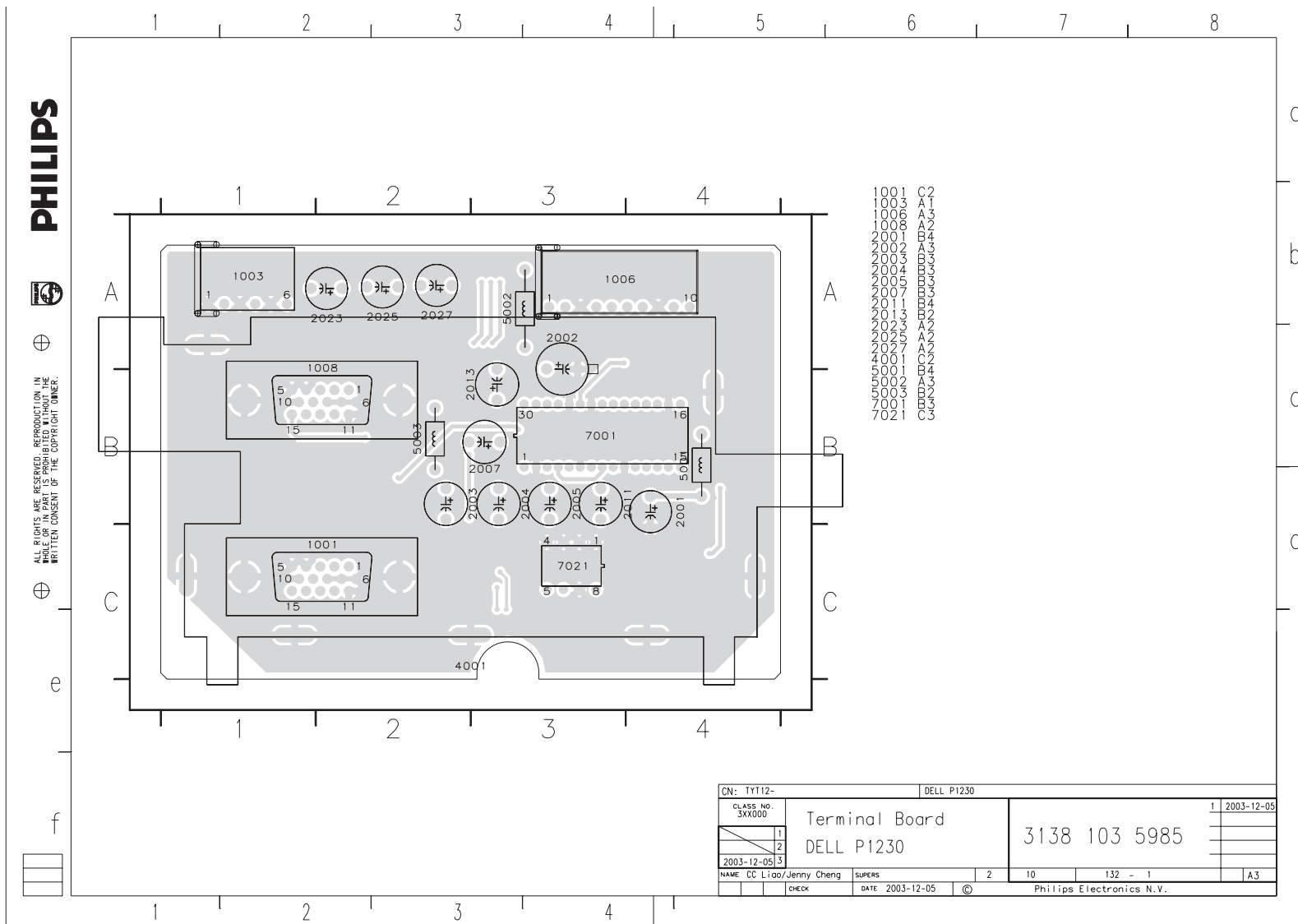


Fig.1

Block Diagram



Terminal Schematic Diagram



Terminal Panel C.B.A.-2

DELL P1230 M25P 23

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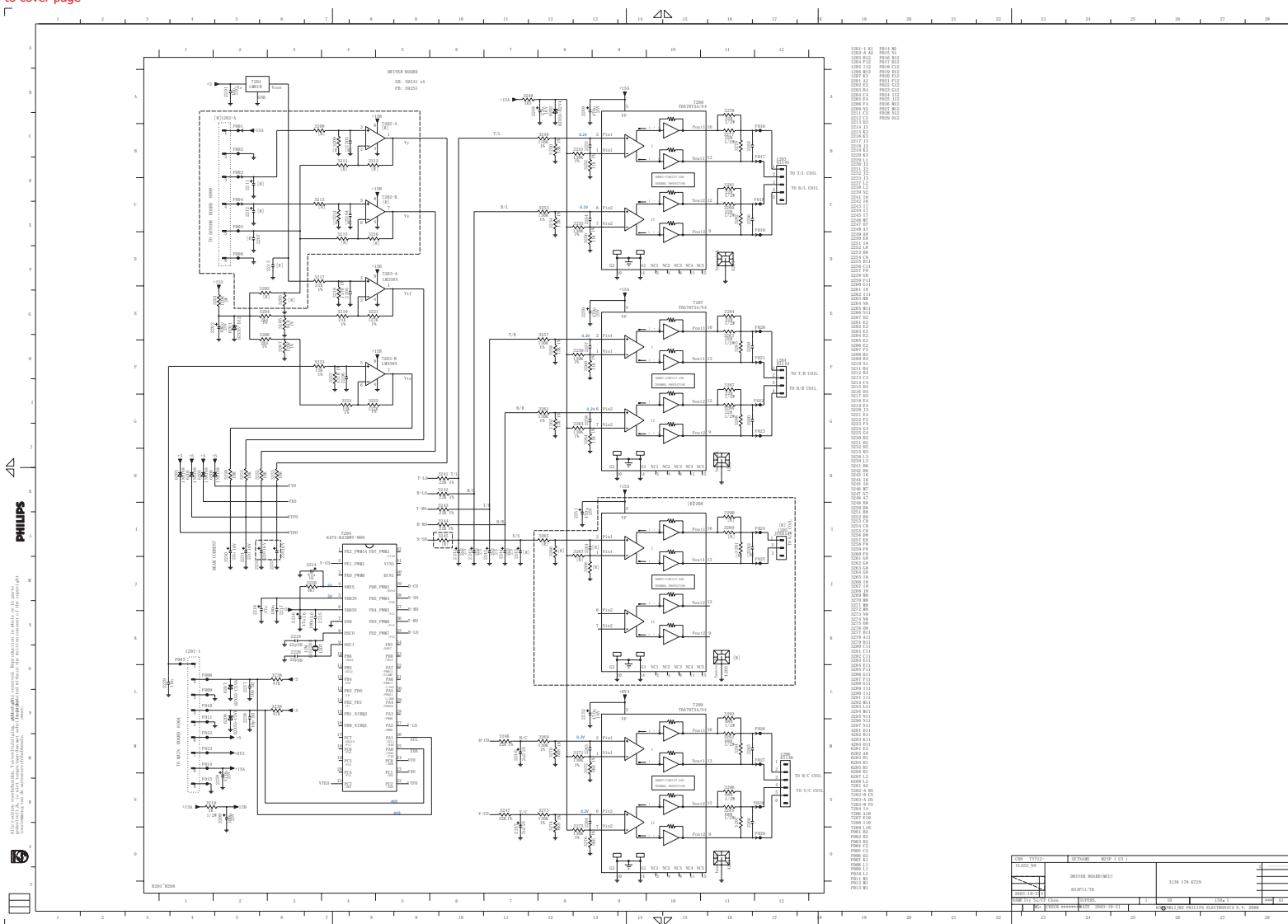
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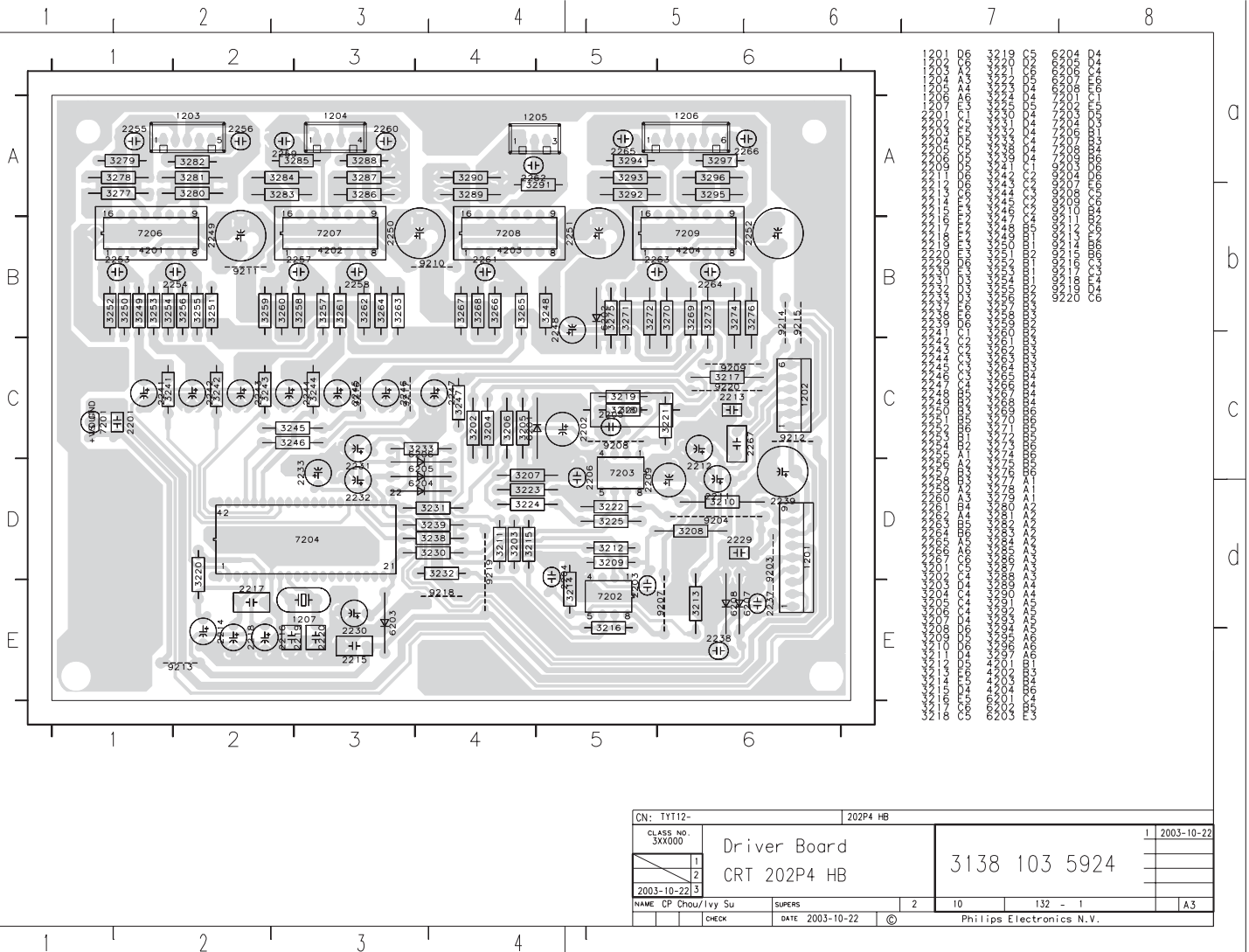
Drive Schematic Diagram



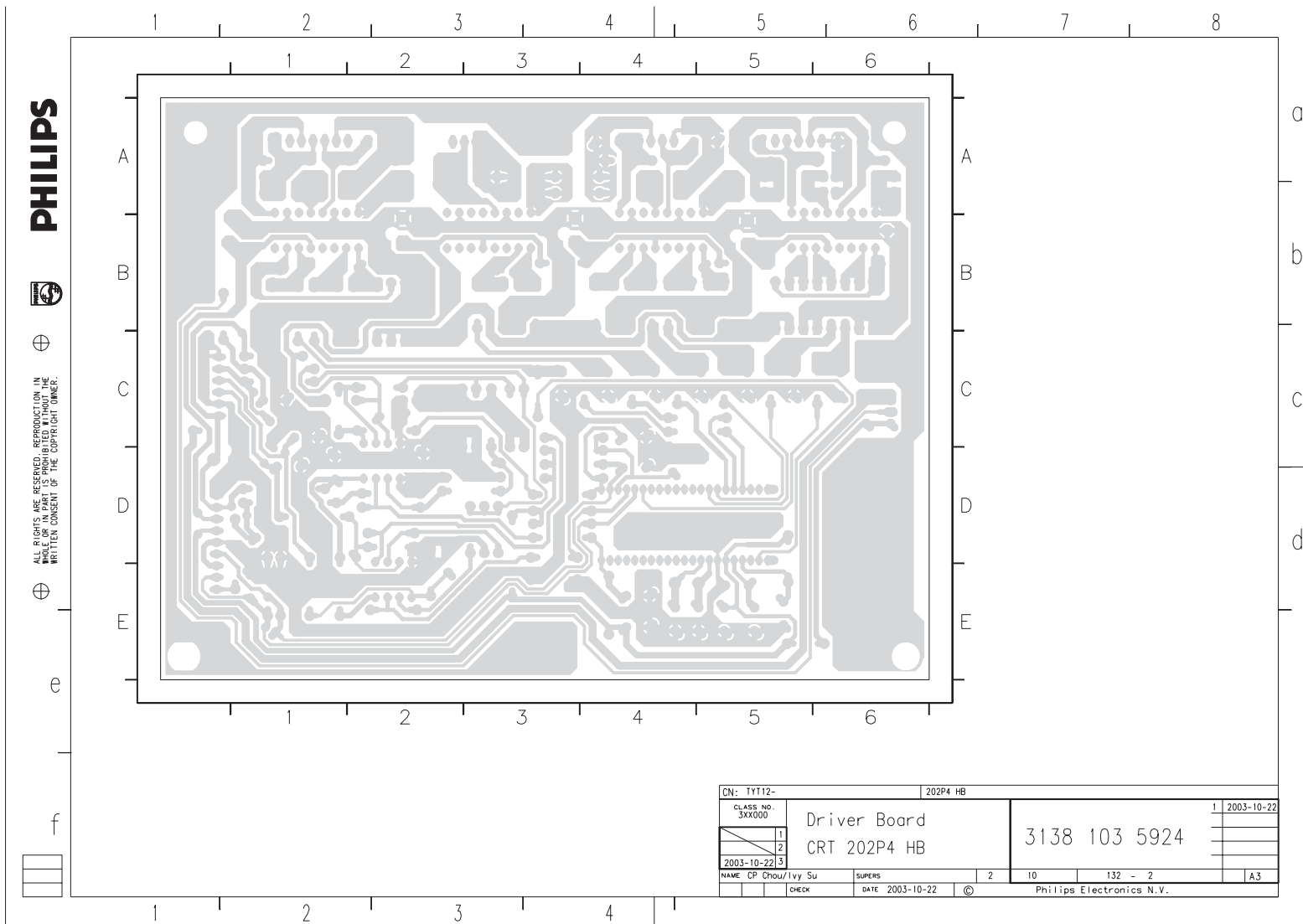
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Drive Panel C.B.A-2



DELL P1230 M25P 27

The schematic diagram illustrates the internal circuitry of a video board. Key sections include:

- VIDEO BOARD**: The main processing unit containing several ICs such as 7805, 7809, 7812, 7815, 7818, 7820, 7822, 7824, 7826, 7828, 7830, 7832, 7834, 7836, 7838, 7840, 7842, 7844, 7846, 7848, 7850, 7852, 7854, 7856, 7858, 7860, 7862, 7864, 7866, 7868, 7870, 7872, 7874, 7876, 7878, 7880, 7882, 7884, 7886, 7888, 7890, 7892, 7894, 7896, 7898, 7900, 7902, 7904, 7906, 7908, 7910, 7912, 7914, 7916, 7918, 7920, 7922, 7924, 7926, 7928, 7930, 7932, 7934, 7936, 7938, 7940, 7942, 7944, 7946, 7948, 7950, 7952, 7954, 7956, 7958, 7960, 7962, 7964, 7966, 7968, 7970, 7972, 7974, 7976, 7978, 7980, 7982, 7984, 7986, 7988, 7990, 7992, 7994, 7996, 7998, 8000.
- VIDEO AMP**: A section dedicated to video signal amplification, featuring multiple op-amp stages.
- POWER SUPPLY**: A section responsible for providing stable power to the system, including voltage regulators and filtering components.
- CONNECTOR**: A section detailing the physical connections to other parts of the system, including pin definitions and signal types.

The diagram uses standard electronic symbols for components like resistors (R), capacitors (C), diodes (D), and integrated circuits (IC). It also includes a legend at the bottom right indicating that a circle symbol denotes a ground connection.

2770E A14	2770E B2	FROM A14
2770E B1	2770E B3	FROM B1
2770E B4	2770E B5	FROM B4
2770E B6	2770E B7	FROM B6
2770E B8	2770E B9	FROM B8
2770E B10	2770E B11	FROM B10
2770E B12	2770E B13	FROM B12
2770E B14	2770E B15	FROM B14
2770E B16	2770E B17	FROM B16
2770E B18	2770E B19	FROM B18
2770E B20	2770E B21	FROM B20
2770E B22	2770E B23	FROM B22
2770E B24	2770E B25	FROM B24
2770E B26	2770E B27	FROM B26
2770E B28	2770E B29	FROM B28
2770E B30	2770E B31	FROM B30
2770E B32	2770E B33	FROM B32
2770E B34	2770E B35	FROM B34
2770E B36	2770E B37	FROM B36
2770E B38	2770E B39	FROM B38
2770E B40	2770E B41	FROM B40
2770E B42	2770E B43	FROM B42
2770E B44	2770E B45	FROM B44
2770E B46	2770E B47	FROM B46
2770E B48	2770E B49	FROM B48
2770E B50	2770E B51	FROM B50
2770E B52	2770E B53	FROM B52
2770E B54	2770E B55	FROM B54
2770E B56	2770E B57	FROM B56
2770E B58	2770E B59	FROM B58
2770E B60	2770E B61	FROM B60
2770E B62	2770E B63	FROM B62
2770E B64	2770E B65	FROM B64
2770E B66	2770E B67	FROM B66
2770E B68	2770E B69	FROM B68
2770E B70	2770E B71	FROM B70
2770E B72	2770E B73	FROM B72
2770E B74	2770E B75	FROM B74
2770E B76	2770E B77	FROM B76
2770E B78	2770E B79	FROM B78
2770E B80	2770E B81	FROM B80
2770E B82	2770E B83	FROM B82
2770E B84	2770E B85	FROM B84
2770E B86	2770E B87	FROM B86
2770E B88	2770E B89	FROM B88
2770E B90	2770E B91	FROM B90
2770E B92	2770E B93	FROM B92
2770E B94	2770E B95	FROM B94
2770E B96	2770E B97	FROM B96
2770E B98	2770E B99	FROM B98
2770E B100	2770E B101	FROM B100
2770E B102	2770E B103	FROM B102
2770E B104	2770E B105	FROM B104
2770E B106	2770E B107	FROM B106
2770E B108	2770E B109	FROM B108
2770E B110	2770E B111	FROM B110
2770E B112	2770E B113	FROM B112
2770E B114	2770E B115	FROM B114
2770E B116	2770E B117	FROM B116
2770E B118	2770E B119	FROM B118
2770E B120	2770E B121	FROM B120
2770E B122	2770E B123	FROM B122
2770E B124	2770E B125	FROM B124
2770E B126	2770E B127	FROM B126
2770E B128	2770E B129	FROM B128
2770E B130	2770E B131	FROM B130
2770E B132	2770E B133	FROM B132
2770E B134	2770E B135	FROM B134
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2770E B138	2770E B139	FROM B138
2770E B140	2770E B141	FROM B140
2770E B142	2770E B143	FROM B142
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2770E B146	2770E B147	FROM B146
2770E B148	2770E B149	FROM B148
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2770E B152	2770E B153	FROM B152
2770E B154	2770E B155	FROM B154
2770E B156	2770E B157	FROM B156
2770E B158	2770E B159	FROM B158
2770E B160	2770E B161	FROM B160
2770E B162	2770E B163	FROM B162
2770E B164	2770E B165	FROM B164
2770E B166	2770E B167	FROM B166
2770E B168	2770E B169	FROM B168
2770E B170	2770E B171	FROM B170
2770E B172	2770E B173	FROM B172
2770E B174	2770E B175	FROM B174
2770E B176	2770E B177	FROM B176
2770E B178	2770E B179	FROM B178
2770E B180	2770E B181	FROM B180
2770E B182	2770E B183	FROM B182
2770E B184	2770E B185	FROM B184
2770E B186	2770E B187	FROM B186
2770E B188	2770E B189	FROM B188
2770E B190	2770E B191	FROM B190
2770E B192	2770E B193	FROM B192
2770E B194	2770E B195	FROM B194
2770E B196	2770E B197	FROM B19

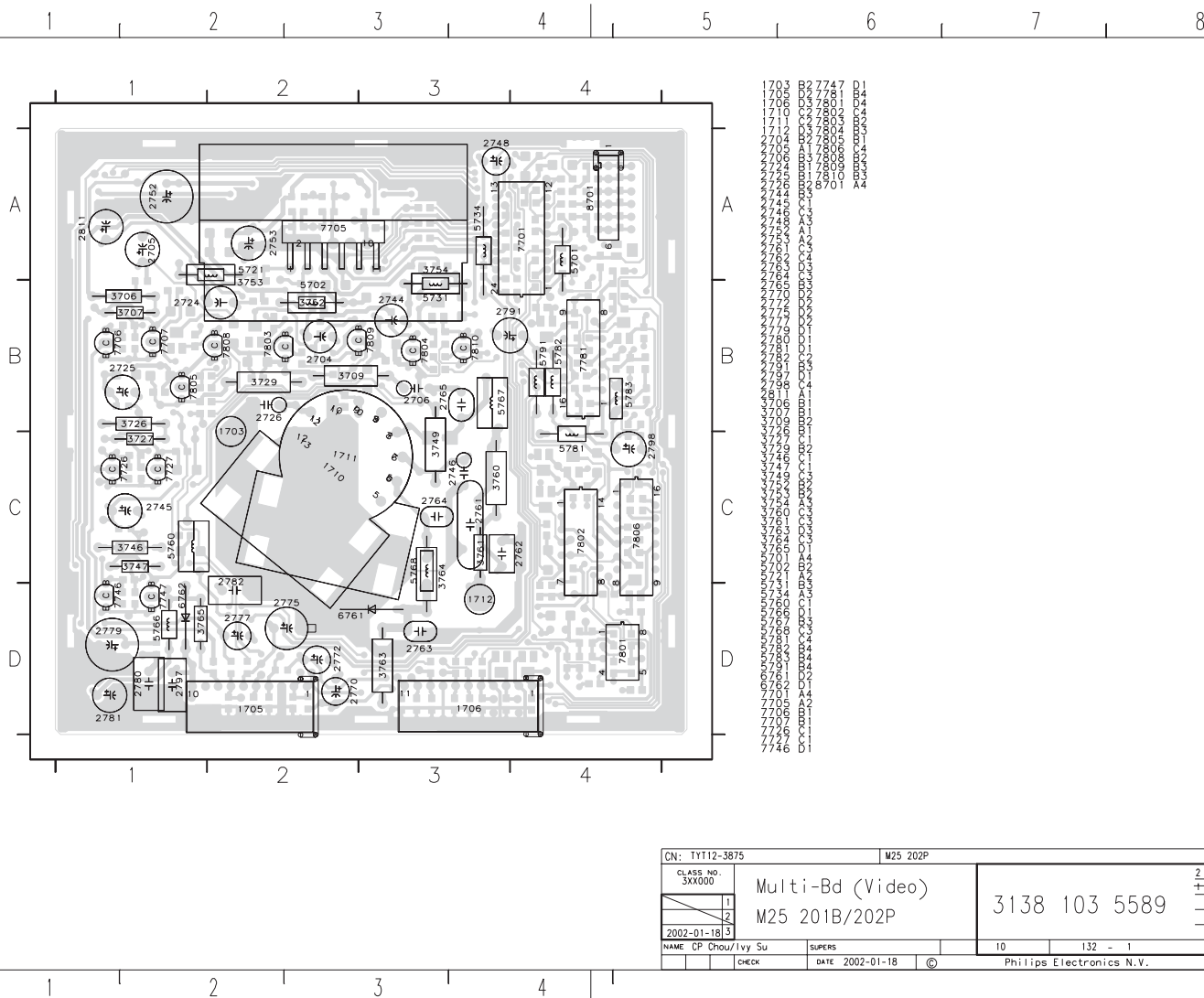
NOTES:
● STANDS FOR CHIP COMPONENT

[illegible]

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CN: TY112-3875			M25 202P								
CLASS NO. 3XX000											
			Multi-Bd (Video) M25 201B/202P			3138 103 5589			2	2003-10-18	
									1	2002-01-18	
									2		
									3		
2002-01-18											
NAME CP Chou/Ivy Su			SUPERS			10			132 - 1		
CHECK			DATE 2002-01-18			Ⓢ			Philips Electronics N.V.		
									A3		

Video Panel C.B.A.-2

DELL P1230 M25P 29

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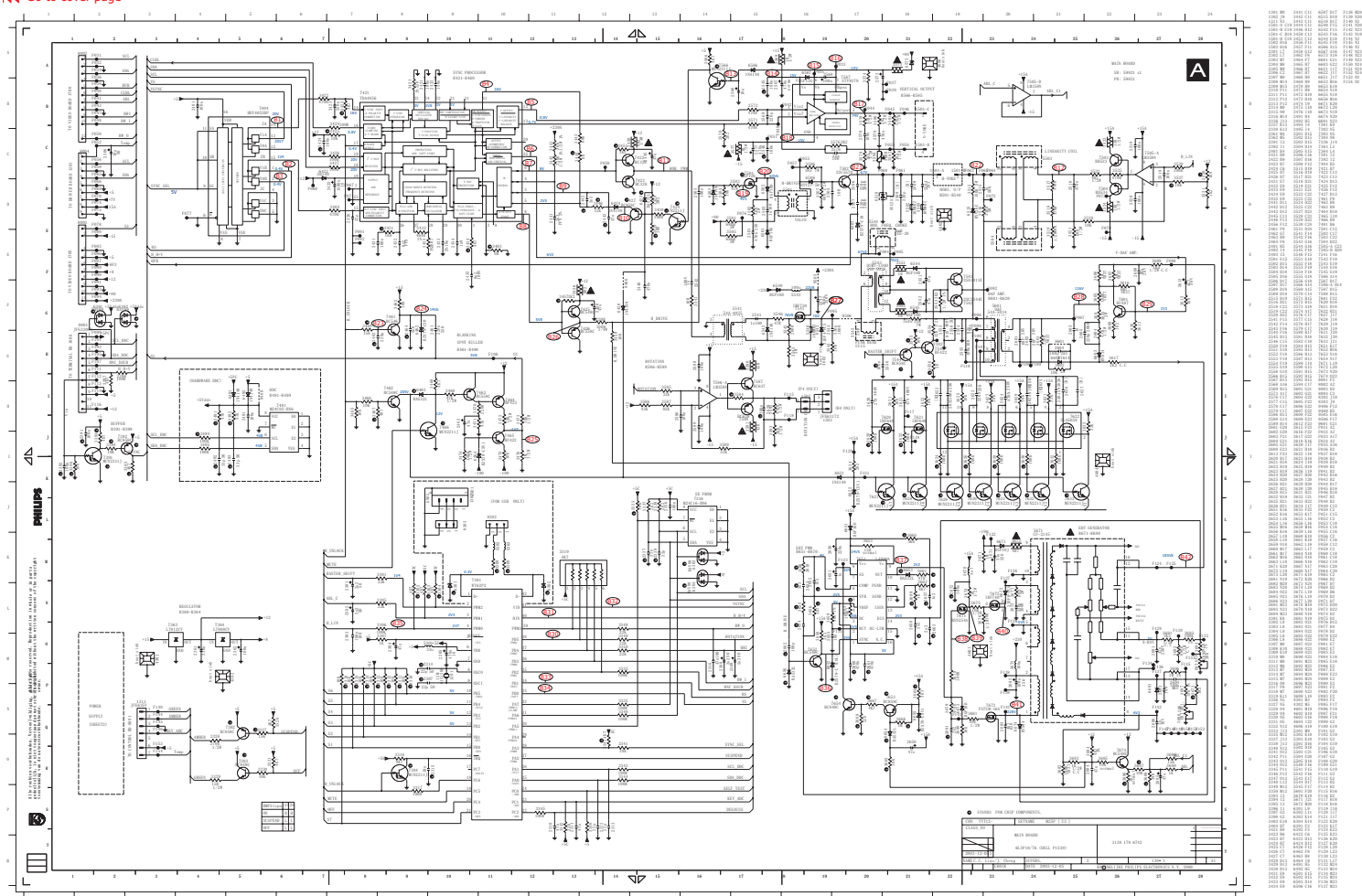
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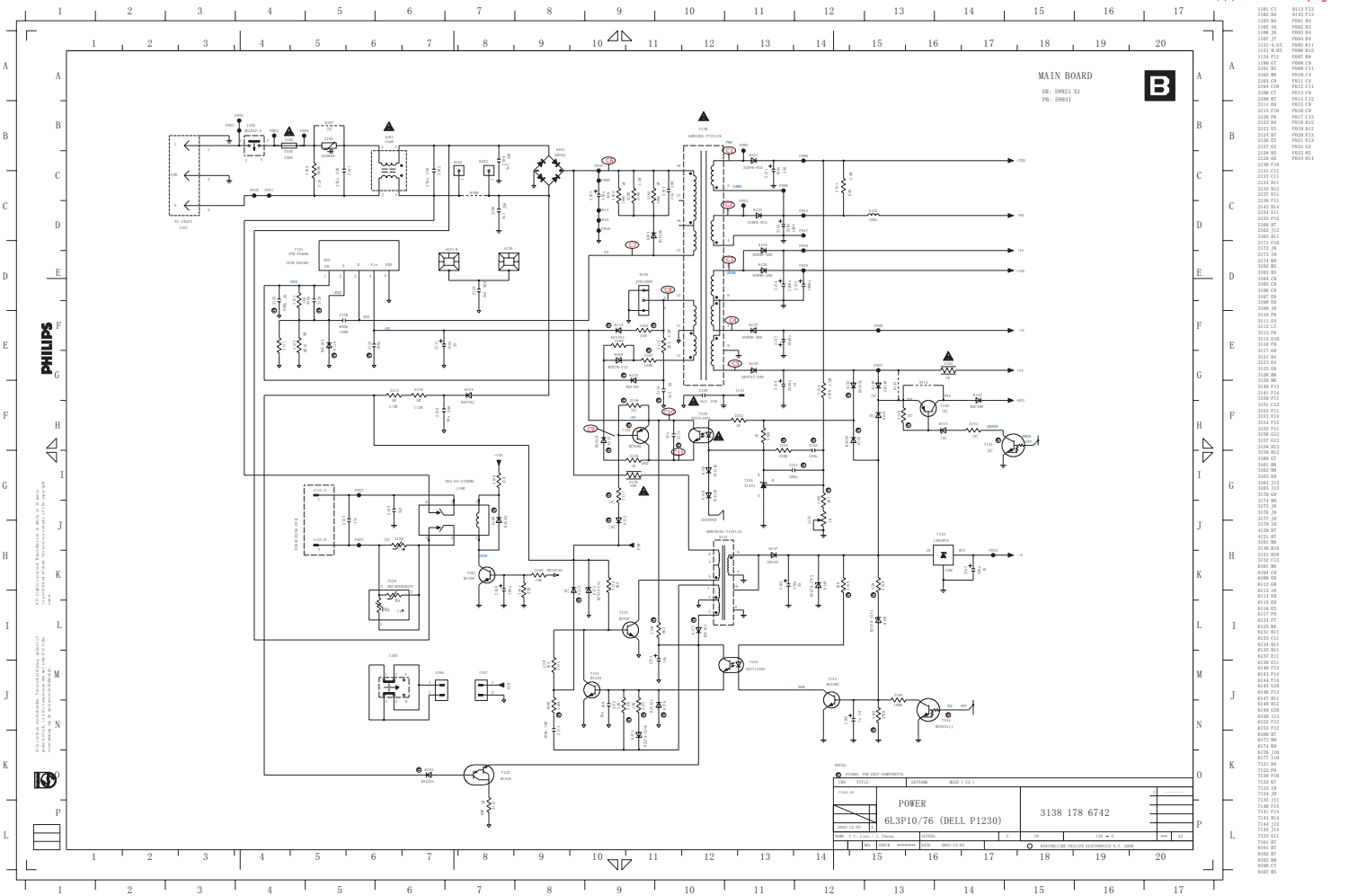
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Main Schematic Diagram -1



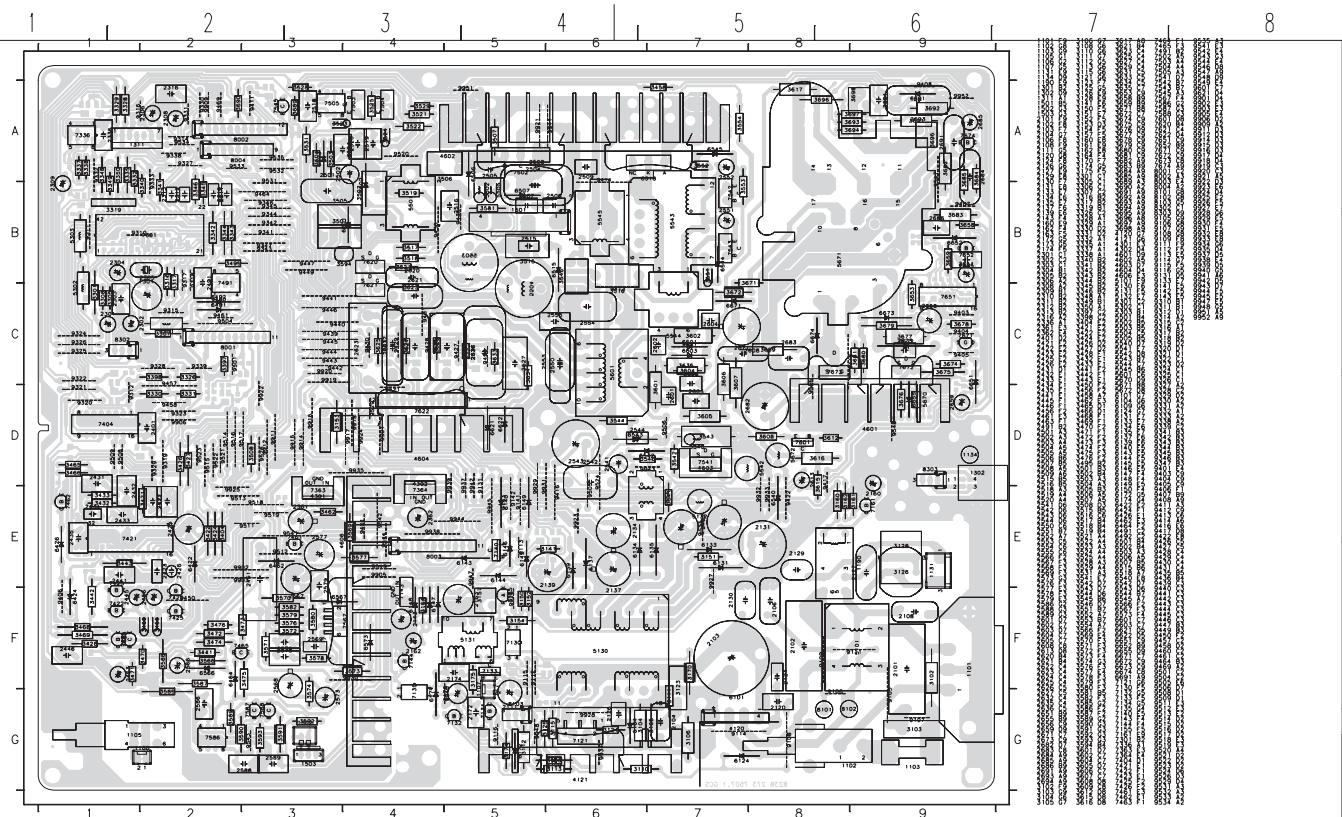
Main Schematic Diagram-2



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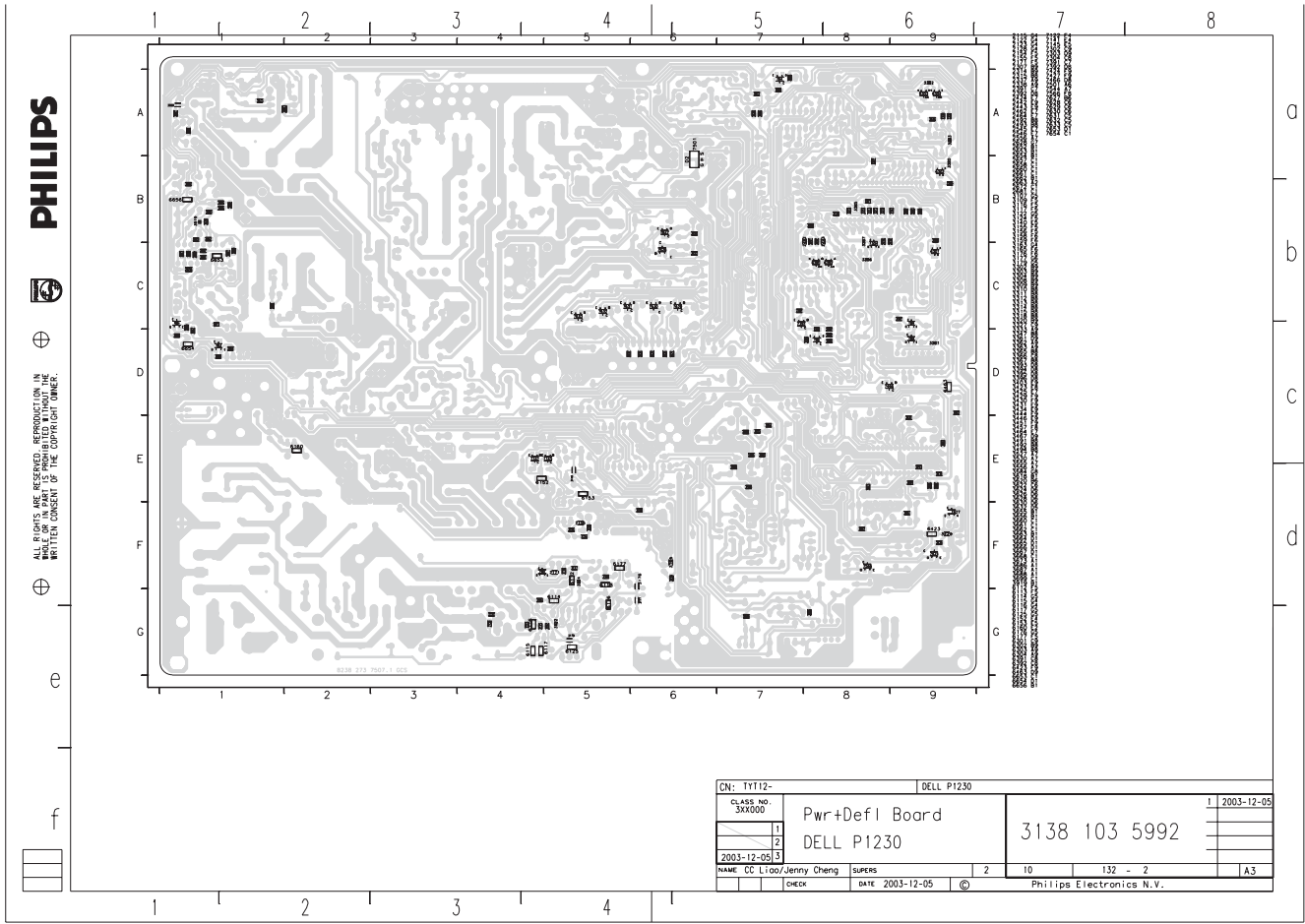


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CN: TYT12-		DELL P1230	
CLASS NO: 3XX000		1 2003-12-05	
1 Pwr+Defl Board		3138 103 5992	
2 DELL P1230			
3 2003-12-05			
NAME CC Liao/Jenny Cheng		SUPERS	
2		10	
132 - 1		A3	
NAME CC Liao/Jenny Cheng		SUPERS	
DATE 2003-12-05		© Philips Electronics N.V.	

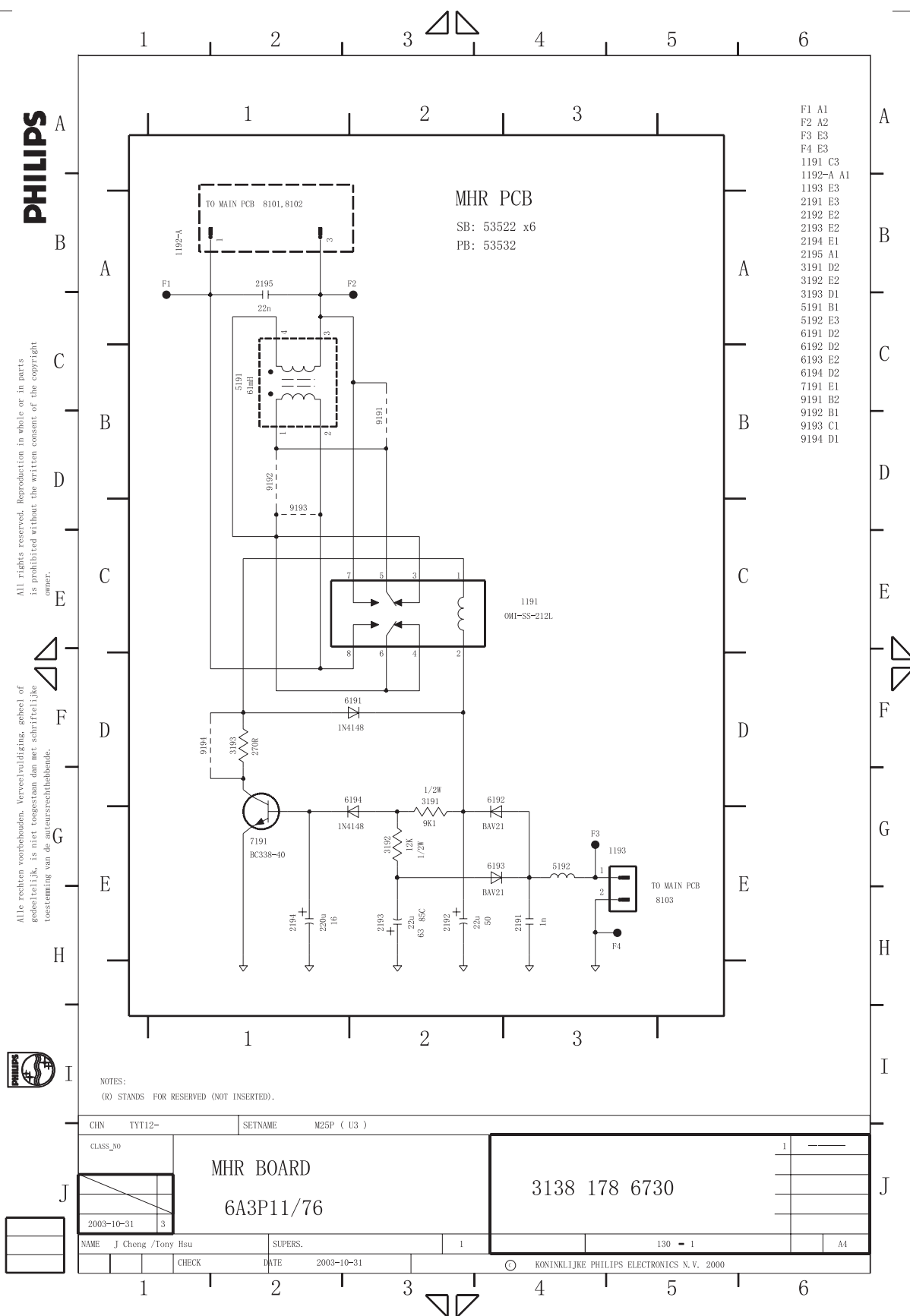
Main Panel C.B.A.-2



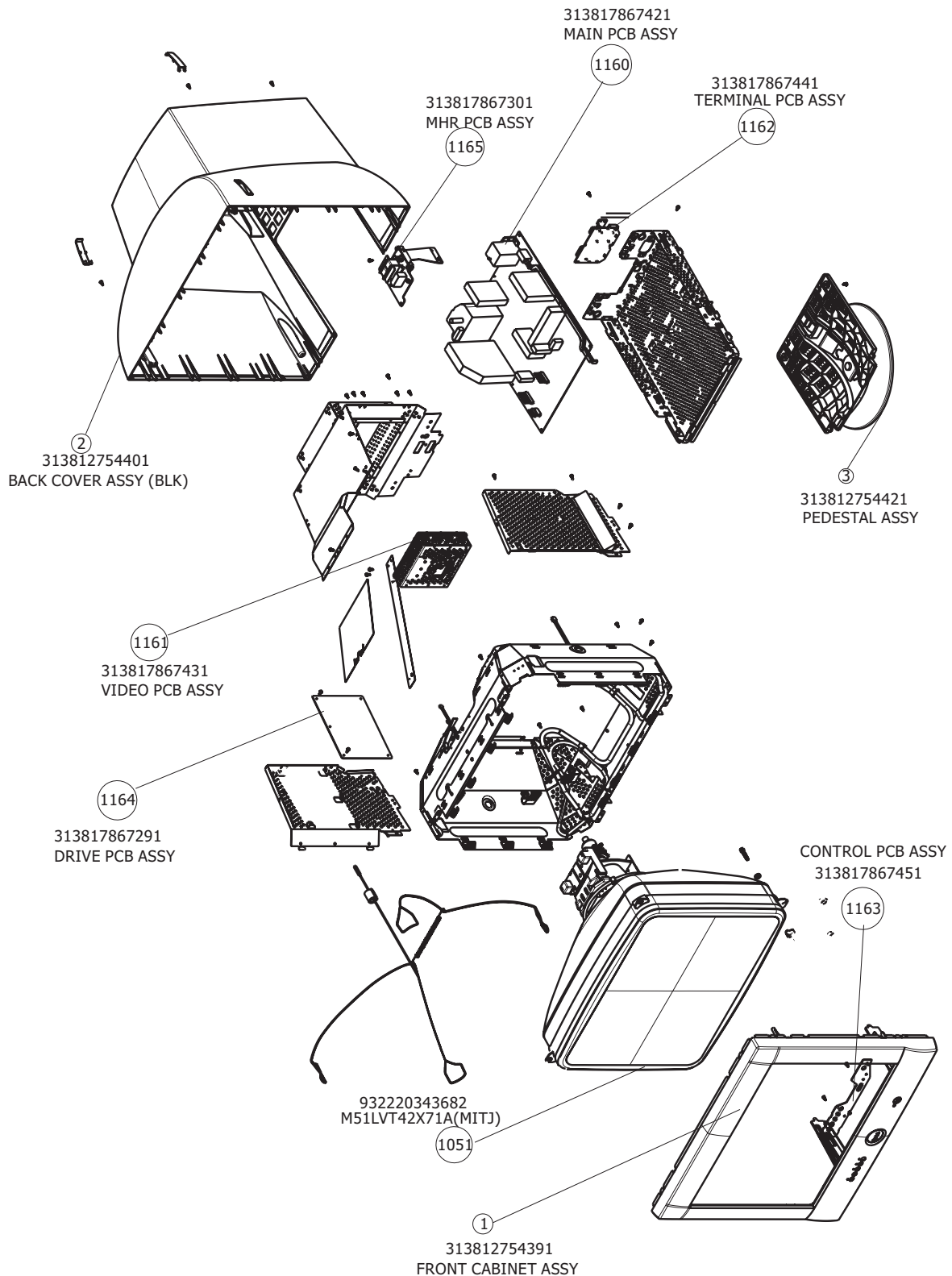
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Exploded View



Recommended Parts List

DELL P1230 M25P

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Model : 6L3P10/76(863900015121)

0001	313812754391	FRONT CABINET ASSY-MG	7505	933984890682	IC LM358N (ST00) L
0002	313812754401	BACK COVER ASSY-MG	7541	932218090687	TRANS IRF730B
0003	313812754421	PEDESTAL ASSY-MG	7542	932204822682	TRA POW 2SC2344E (TSAJ) B
0044	313810461901	BASE-MG	7543	932204823682	TRA POW 2SA1011E (TSAJ) B
0047	313810461701	POWER BUTTON-SILVER	7544	933967380685	TRA SIG SM BC858C (ONSE) R
0053	313810461891	SWIVEL-MG	7545	932214469676	TRA SIG BF422 (KEC0) A
0450	313810662731	CARTON	7566	932209265685	TRA SIG SM MUN2211J (ONSE) R
0451	313810662741	CUSHION-TOP FRONT	7567	931900234682	IC STV9379 (ST00) L
0452	313810662751	CUSHION-TOP REAR	7586	933984890682	IC LM358N (ST00) L
0453	313810662761	CUSHION-BOTTOM	7587	933221930126	TRA SIG BC637 (PHSE) A
0454	313810663051	P.E. BAG	7588	933221960126	TRA SIG BC638 (PHSE) A
0601	313811706561	E-D.F.U. ASSY	7601	932206519687	TRA POW BUX87 (ST00) L
1053	313812874901	MAINSKORD	7620	932217996687	FET POW IRF640B (FSC0) L
1054	313819870591	CORD SUB-D 15/1M8/15 D-SUB BK	7622	932214562667	FET POW SLA5085 (SAKJ) L
1103	242208600208	FUSE 5X20 HT 4A 250V IEC B	7627	932209265685	TRA SIG SM MUN2211J (ONSE) R
5671	313819870921	TFM LOT LAYER 13MM WIRE	7651	932212152682	IC L4990A (ST00) L
7001	932214260682	IC AN5870 (MATJ) L	7652	932209011673	TRA SIG BC548C (KEC0) A
7021	932215333682	IC M24C02-BN6 (ST00) L	7653	933967380685	TRA SIG SM BC858C (ONSE) R
7121	932214039682	IC STR-F6456(LF1352) (SAKJ) B	7654	933967310685	TRA SIG SM BC848C (ONSE) R
7122	933967380685	TRA SIG SM BC858C (ONSE) R	7671	934003960126	FET SIG BSN254A (PHSE) A
7130	932214014667	OPT CP TCET1103(G) (VISH) L	7672	932217890687	FET POW IRF740B (FSC0) L
7132	933567120126	TRA SIG BC516 (PHSE) A	7673	932216023687	FET POW STP7NB80 (ST00) L
7133	932206519687	TRA POW BUX87 (ST00) L	7674	932209011673	TRA SIG BC548C (KEC0) A
7134	933953420676	TRA SIG TBC338-40 (TOSJ) A	7701	935264061112	IC TDA4887PS/V1 (PHSE) L
7135	932214014667	OPT CP TCET1103(G) (VISH) L	7705	932220610682	IC LM2412T (NSC0) L
7143	932209200687	IC L4940V5 (ST00) L	7706	932214469676	TRA SIG BF422 (KEC0) A
7144	932209011673	TRA SIG BC548C (KEC0) A	7781	823827445601	OSD,IC (6805-N160PH-17A)
7145	932209265685	TRA SIG SM MUN2211J (ONSE) R	7782	932209265685	TRA SIG SM MUN2211J (ONSE) R
7155	932208367676	IC TL431CZ S (ST00) A	7891	932213999682	IC LM61BIZ (NSC0) B
7161	933953420676	TRA SIG TBC338-40 (TOSJ) A			
7191	933953420676	TRA SIG TBC338-40 (TOSJ) A			
7201	932213999682	IC LM61BIZ (NSC0) B			
7203	933984890682	IC LM358N (ST00) L			
7204	932220364682	IC WT61P4-K420WT-000 (WESE) L			
7206	935262849112	IC TDA7073A/N4 (PHSE) L			
7301	823827445611	CPU,IC (6148-K420PH-85A)			
7302	933967380685	TRA SIG SM BC858C (ONSE) R			
7303	933967310685	TRA SIG SM BC848C (ONSE) R			
7304	932209265685	TRA SIG SM MUN2211J (ONSE) R			
7336	932212662682	IC M24C16-BN6 (ST00) L			
7363	933400610682	IC MC7812CT (MOTA) B			
7364	933920810682	IC L7808CV (ST00) L			
7391	932209265685	TRA SIG SM MUN2211J (ONSE) R			
7392	933967380685	TRA SIG SM BC858C (ONSE) R			
7404	933282660652	IC HEF4053BP (PHSE) L			
7421	935267452112	IC TDA4856/V3 (PHSE) L			
7422	933953420676	TRA SIG TBC338-40 (TOSJ) A			
7423	933953410676	TRA SIG TBC328-40 (TOSJ) A			
7424	932209265685	TRA SIG SM MUN2211J (ONSE) R			
7425	932209011673	TRA SIG BC548C (KEC0) A			
7426	932210142676	TRA SIG BC558C (KEC0) A			
7427	933967380685	TRA SIG SM BC858C (ONSE) R			
7461	933237780126	TRA SIG BC546B (PHSE) A			
7462	932209011673	TRA SIG BC548C (KEC0) A			
7463	932210142676	TRA SIG BC558C (KEC0) A			
7464	932214472676	TRA SIG BF423 (KEC0) A			
7465	932214469676	TRA SIG BF422 (KEC0) A			
7466	932209265685	TRA SIG SM MUN2211J (ONSE) R			
7501	934000540115	FET SIG SM BSP126 (PHSE) R			
7502	932217972682	TRA POW 2SC5570 (TOSJ) L			
7503	932205702687	TRA POW BD533 (ST00) L			
7504	932205703687	TRA POW BD534 (ST00) L			

Model : 6L3P10/76

Mechanical

0001	313812754391	FRONT CABINET ASSY-MG
0002	313812754401	BACK COVER ASSY-MG
0003	313812754421	PEDESTAL ASSY-MG
0041	313810461681	FRONT CABINET-MG
0042	313810461731	BACK COVER-MG
0043	313810461881	REAR COVER-MG
0044	313810461901	BASE-MG
0045	313810461691	FUNCTION BUTTON-SILVER
0046	313810461711	POWER HOLDER
0047	313810461701	POWER BUTTON-SILVER
0048	313810461721	LENS -POWER
0053	313810461891	SWIVEL-MG
0056	313810449481	FOOT RUBBER
0128	313810445691	HOUSING COVER

Various

0450	313810662731	CARTON
0451	313810662741	CUSHION-TOP FRONT
0452	313810662751	CUSHION-TOP REAR
0453	313810662761	CUSHION-BOTTOM
0454	313810663051	P.E. BAG

CRT

1051	▲ 932220343682	CRT M51LVT42X71A (MITJ) B
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Main PCB

1160	313817867421	MAIN PCB ASSY(DELL)
1161	313817867431	VIDEO BOARD ASSY(DELL)
1162	313817867441	TERMIAL PCB ASSY(DELL)
1163	313817867451	CONTROL PCB ASSY(DELL)
1164	313817867291	DRIVER PCB ASSY
1165	313817867301	MHR PCB ASSY

Accessories

0601	313811706561	E-D.F.U. ASSY
0616	313811706001	HEX CODE OF F/W (NO MATL REQ)
1053	▲ 313812874901	MAINSORD
1054	313819870591	CORD SUB-D 15/1M8/15 D-SUB BK

Others

0222	313811578981	LABEL-CPU(DRIVER)
1052	313818808521	ALL CHASSIS KITS(DELL)
1055	313817861921	D&CORNER COIL.(202P4)
1061	313818873431	COIL DEGAUS TDC196
1063	313818873441	COIL CORNER TDC200 A
1064	313818873451	COIL CORNER TDC200
1103	▲ 242208600208	FUSE 5X20 HT 4A 250V IEC B
1190	243813200141	RELAY 2P 12V 5A OSA-SS Y
1191	241112102038	RELAY 2P 12V 5A OMISS212L B
1207	243854300061	RES XTL 12MHZ 30P HC49/U B
1211	313817867521	MTP ASSY
1265	313817867481	EEPROM ASSY(DELL)
1274	313817853361	CERC CAP+CORE ASSY-2765
1301	243854300064	RES XTL 12MHZ 32P HC49/S B
1796	313816879171	FERRITE CORE C8BRH 3.5X3.2X1
1797	313816879171	FERRITE CORE C8BRH 3.5X3.2X1
1798	313816879171	FERRITE CORE C8BRH 3.5X3.2X1
1799	313816879171	FERRITE CORE C8BRH 3.5X3.2X1
1160	313817867421	MAIN PCB ASSY(DELL)

4444	313810610349	CD ROM - SERVICE MANUAL
4444	313810610350	SERVICE MANUAL
1160	313817867421	MAIN PCB ASSY(DELL)
—H—		
2101	203831000007	CAP MPP 275V S 470N PM10 B
2102	203831000007	CAP MPP 275V S 470N PM10 B
2103	202203100085	ELCAP HP 450V S 330U PM20 B
2104	203830200305	CAP MPOL 400V S 33N PM5 B
2106	202055490139	CERSAF NSB 250V S 4N7 PM20 B
2108	202055490139	CERSAF NSB 250V S 4N7 PM20 B
2111	202203100083	ELCAP KM 25V S 150U PM20 A
2115	223858015627	CER2 0805 X7R 50V 2N2 PM10 R
2120	203830200167	CAP MPOL 400V S 10N PM10 B
2122	223886115561	CER1 0805 NP0 50V 560P PM5 R
2123	223891015649	CER2 0805 X7R 25V 100N PM10 R
2124	202055790153	CER2 DC B 500V S 2N2 PM10 A
2126	202055890556	CERHDT RR 1KV S 680P PM10 A
2127	203830100208	CAP PP PPN 250V S 47N PM5 B
2128	223886115331	CER1 0805 NP0 50V 330P PM5 R
2129	202055490127	CERSAF NSA 250V S 2N2 PM20 B
2130	202055490149	CERSAF NSA 250V S 3N3 PM20 B
2131	202203100066	ELCAP KM 350V S 100U PM20 B
2133	202203100067	ELCAP GL 100V S 220U PM20 B
2134	202203100225	ELCAP GL 25V S 2200U PM20 B
2135	202203100223	ELCAP GL 25V S 1000U PM20 B
2137	202203100223	ELCAP GL 25V S 1000U PM20 B
2139	202202000706	ELCAP GS 16V S 2200U PM20 B
2143	203803527203	ELCAP KM 16V S 220U PM20 A
2154	223886115101	CER1 0805 NP0 50V 100P PM5 R
2155	222291019856	CER2 0805 Y5V 25V 330N P8020 R
2160	202202000833	ELCAP GS 10V S 100U PM20 A
2162	202202000836	ELCAP GS 50V S 1U PM20 A
2163	202202000938	ELCAP GS 25V S 470U PM20 A
2171	223858015645	CER2 0805 X7R 50V 47N PM10 R
2172	203830250089	CAP MPOL 100V S 10N PM10 A
2173	203803527501	ELCAP KM 50V S 10U PM20 A
2174	203830250095	CAP MPOL 100V S 100N PM10 A
2301	202202000805	ELCAP GS 50V S 2U2 PM20 A
2302	202202000805	ELCAP GS 50V S 2U2 PM20 A
2303	203830250212	CAP MPOL 100V S 100N PM5 A
2304	203803521206	ELCAP GS 16V S 47U PM20 A
2305	203803521218	ELCAP GS 16V S 470U PM20 A
2306	203803521501	ELCAP GS 50V S 10U PM20 A
2307	223886115229	CER1 0805 NP0 50V 22P PM5 R
2308	202202000805	ELCAP GS 50V S 2U2 PM20 A
2309	202202000805	ELCAP GS 50V S 2U2 PM20 A
2310	203830250094	CAP MPOL 100V S 47N PM10 A
2311	203830250094	CAP MPOL 100V S 47N PM10 A
2312	202055290594	CER1 DC NP0 50V S 22P PM5 A
2313	202055290594	CER1 DC NP0 50V S 22P PM5 A
2314	223886115229	CER1 0805 NP0 50V 22P PM5 R
2315	223858015636	CER2 0805 X7R 50V 10N PM10 R
2316	203830250094	CAP MPOL 100V S 47N PM10 A
2336	203830250095	CAP MPOL 100V S 100N PM10 A
2337	223886115229	CER1 0805 NP0 50V 22P PM5 R
2338	223886115229	CER1 0805 NP0 50V 22P PM5 R
2361	203803527204	ELCAP KM 16V S 330U PM20 A
2362	203803527202	ELCAP KM 16V S 100U PM20 A
2391	223891015649	CER2 0805 X7R 25V 100N PM10 R
2392	223886115101	CER1 0805 NP0 50V 100P PM5 R

2401	203830250095	CAP MPOL 100V S 100N PM10 A
2421	203830250095	CAP MPOL 100V S 100N PM10 A
2422	203830250121	CAP MPOL 100V S 150N PM10 A
2423	202055290607	CER1 DC NP0 50V S 220P PM5 A
2424	223891015649	CER2 0805 X7R 25V 100N PM10 R
2425	202203100097	ELCAP KM 16V S 1500U PM20 B
2426	202055290594	CER1 DC NP0 50V S 22P PM5 A
2431	203830250212	CAP MPOL 100V S 100N PM5 A
2432	203830150186	CAP PP PPN 100V S 8N2 PM5 A
2433	203830250218	CAP MPOL 100V S 10N PM2 A
2434	203830150147	CAP PP PPN 100V S 1N8 PM5 A
2435	203830150186	CAP PP PPN 100V S 8N2 PM5 A
2441	203830150191	CAP PP PPN 100V S 3N3 PM2 A
2442	223858015629	CER2 0805 X7R 50V 3N3 PM10 R
2443	223858015645	CER2 0805 X7R 50V 47N PM10 R
2445	203803521206	ELCAP GS 16V S 47U PM20 A
2446	203830250099	CAP MPOL 100V S 470N PM10 A
2456	203803521206	ELCAP GS 16V S 47U PM20 A
2461	203830100104	CAP PP PPN 250V S 220N PM5 B
2462	223886115221	CER1 0805 NP0 50V 220P PM5 R
2463	203803521206	ELCAP GS 16V S 47U PM20 A
2464	223858015633	CER2 0805 X7R 50V 5N6 PM10 R
2491	203830250095	CAP MPOL 100V S 100N PM10 A
2492	223886115339	CER1 0805 NP0 50V 33P PM5 R
2493	223886115339	CER1 0805 NP0 50V 33P PM5 R
2501	202233300303	CAP MPP 250V S 470N PM5 B
2502	203803522801	ELCAP BP NK 160V S 1U PM20 A
2503	203830250095	CAP MPOL 100V S 100N PM10 A
2504	222237590705	CAP PP-MPP 2K5V S 3N3 PM5 B
2506	202055890561	CERHDT RR 2KV S 220P PM10 A
2507	202055890561	CERHDT RR 2KV S 220P PM10 A
2515	202055890557	CERHDT RR 1KV S 1N PM10 A
2516	203830250099	CAP MPOL 100V S 470N PM10 A
2518	203830250095	CAP MPOL 100V S 100N PM10 A
2519	203830250095	CAP MPOL 100V S 100N PM10 A
2520	203830250095	CAP MPOL 100V S 100N PM10 A
2541	203803522801	ELCAP BP NK 160V S 1U PM20 A
2542	203830100117	CAP MPP 100V S 1U PM10 B
2543	202203100066	ELCAP KM 350V S 100U PM20 B
2544	202055890562	CERHDT RR 2KV S 330P PM10 A
2545	223891015649	CER2 0805 X7R 25V 100N PM10 R
2546	223891015649	CER2 0805 X7R 25V 100N PM10 R
2551	203803527303	ELCAP KM 25V S 47U PM20 A
2552	203803527303	ELCAP KM 25V S 47U PM20 A
2553	202233300301	CAP PP PPN 400V S 91N PM5 B
2554	203830100201	CAP PP PPN 400V S 82N PM5 B
2555	203830250095	CAP MPOL 100V S 100N PM10 A
2556	223891015649	CER2 0805 X7R 25V 100N PM10 R
2566	203803527501	ELCAP KM 50V S 10U PM20 A
2567	202203100221	ELCAP KM 25V S 470U PM20 B
2568	203803521405	ELCAP GS 35V S 100U PM20 A
2569	202055290607	CER1 DC NP0 50V S 220P PM5 A
2576	203830250093	CAP MPOL 100V S 22N PM10 A
2577	202203100221	ELCAP KM 25V S 470U PM20 B
2578	203830250095	CAP MPOL 100V S 100N PM10 A
2579	203830250099	CAP MPOL 100V S 470N PM10 A
2586	203830250212	CAP MPOL 100V S 100N PM5 A
2588	203830250095	CAP MPOL 100V S 100N PM10 A
2589	203830250095	CAP MPOL 100V S 100N PM10 A
2601	202055890661	CER1 DC SL 2KV S 68P PM5 A
2602	202055890662	CER1 DC SL 2KV S 56P PM5 A
2603	202055890557	CERHDT RR 1KV S 1N PM10 A

2604	202055890604	CERHDT RR 2KV S 100P PM10 A	3158	232273061479	RST SM 0805 RC11 47R PM5 R	3396	232273061103	RST SM 0805 RC11 10K PM5 R
2605	202055890561	CERHDT RR 2KV S 220P PM10 A	3159	232273061182	RST SM 0805 RC11 1K8 PM5 R	3397	213810113472	RST CRB CFR-12 A 4K7 PM5 A
2608	202055800006	CER2 DC E 2KV S 10N P8020 B	3160	212211000325	RST MFLM MF1/2WS A 47R PM1 A	3398	213810113101	RST CRB CFR-12 A 100R PM5 A
2613	202203100222	ELCAP KM 50V S 4U7 PM20 A	3161	213810113223	RST CRB CFR-12 A 22K PM5 A	3403	232273091002	RST SM 0805 JUMP. MAX 0R05 R
2620	202233300302	CAP PP PPN 400V S 27N PM5 B	3162	213810113103	RST CRB CFR-12 A 10K PM5 A	3404	213810113471	RST CRB CFR-12 A 470R PM5 A
2621	823827445891	CAP PP PPN 400V S 47N PM5 B	3163	232273061339	RST SM 0805 RC11 33R PM5 R	3421	212211000392	RST MFLM MF1/2WS A 22K PM1 A
2623	203830100104	CAP PP PPN 250V S 220N PM5 B	3164	213810113101	RST CRB CFR-12 A 100R PM5 A	3422	213810113471	RST CRB CFR-12 A 470R PM5 A
2624	203830100303	CAP MPP MPS 250V S 470N PM5 B	3165	232273061271	RST SM 0805 RC11 270R PM5 R	3423	232273061472	RST SM 0805 RC11 4K7 PM5 R
2625	203830100333	CAP MPP MPS 250V S 910N PM5 B	3170	212020200005	RST FUSE RFS1/2 A 10R PM5 A	3424	213810113101	RST CRB CFR-12 A 100R PM5 A
2626	203830100158	CAP MPP MPS 250V S 1U8 PM5 B	3174	213810113155	RST CRB CFR-12 A 1M5 PM5 A	3425	232273061103	RST SM 0805 RC11 10K PM5 R
2628	232891015649	CER2 0805 X7R 25V 100N PM10 R	3175	212211000358	RST MFLM MF1/2WS A 1K2 PM1 A	3426	213810113101	RST CRB CFR-12 A 100R PM5 A
2632	203830100194	CAP PP PPN 250V S 100N PM5 B	3176	232273061243	RST SM 0805 RC11 24K PM5 R	3427	213810113101	RST CRB CFR-12 A 100R PM5 A
2651	202202000836	ELCAP GS 50V S 1U PM20 A	3177	232273061153	RST SM 0805 RC11 15K PM5 R	3428	213810113225	RST CRB CFR-12 A 2M2 PM5 A
2652	223858015625	CER2 0805 X7R 50V 1N5 PM10 R	3179	232273061822	RST SM 0805 RC11 8K2 PM5 R	3429	232273061155	RST SM 0805 RC11 1M5 PM5 R
2653	223858015629	CER2 0805 X7R 50V 3N3 PM10 R	3193	212010590779	RST MOX 1W RSS A 270R PM5 A	3430	232273061101	RST SM 0805 RC11 100R PM5 R
2655	203830150151	CAP PP PPN 100V S 10N PM2 A	3301	213810113223	RST CRB CFR-12 A 22K PM5 A	3431	232273061182	RST SM 0805 RC11 1K8 PM5 R
2656	203803527305	ELCAP KM 25V S 220U PM20 A	3302	232273061472	RST SM 0805 RC11 4K7 PM5 R	3432	212211000451	RST MFLM MF1/2WS A 464R PM1 A
2657	223858015624	CER2 0805 X7R 50V 1N2 PM10 R	3303	232273061472	RST SM 0805 RC11 4K7 PM5 R	3433	212211000446	RST MFLM MF1/2WS A 2K67 PM1 A
2658	222278019867	CER2 0805 Y5V 16V 2U2 P8020 R	3304	232273061472	RST SM 0805 RC11 4K7 PM5 R	3434	232273061472	RST SM 0805 RC11 4K7 PM5 R
2659	203803521306	ELCAP GS 25V S 47U PM20 A	3305	213810113223	RST CRB CFR-12 A 22K PM5 A	3441	212211000403	RST MFLM MF1/2WS A 56K PM1 A
2660	223878019858	CER2 0805 Y5V 16V 470N P8020 R	3306	213810113104	RST CRB CFR-12 A 100K PM5 A	3442	232224182204	RST MGL VR25 A 220K PM1 A
2661	223878019858	CER2 0805 Y5V 16V 470N P8020 R	3307	213810113102	RST CRB CFR-12 A 1K PM5 A	3443	213810113683	RST CRB CFR-12 A 68K PM5 A
2662	223866115101	CER1 0805 NP0 50V 100P PM5 R	3310	232273061103	RST SM 0805 RC11 10K PM5 R	3444	232273091002	RST SM 0805 JUMP. MAX 0R05 R
2663	222278019867	CER2 0805 Y5V 16V 2U2 P8020 R	3311	232273061103	RST SM 0805 RC11 10K PM5 R	3446	232273061122	RST SM 0805 RC11 12K PM5 R
2671	202203100154	ELCAP KM 250V S 33U PM20 B	3312	232273061103	RST SM 0805 RC11 10K PM5 R	3450	230620403828	RST FUSE NFR25 S 8R2 PM5 A
2672	223891015649	CER2 0805 X7R 25V 100N PM10 R	3313	232273061103	RST SM 0805 RC11 10K PM5 R	3451	232273061122	RST SM 0805 RC11 1K2 PM5 R
2673	202055890562	CERHDT RR 2KV S 330P PM10 A	3314	232273061103	RST SM 0805 RC11 10K PM5 R	3456	230620403828	RST FUSE NFR25 S 8R2 PM5 A
2681	223858015627	CER2 0805 X7R 50V 2N2 PM10 R	3315	232273061103	RST SM 0805 RC11 10K PM5 R	3457	232273061122	RST SM 0805 RC11 1K2 PM5 R
2682	202203100087	ELCAP KL 350V S 100U PM20 B	3316	213810113472	RST CRB CFR-12 A 4K7 PM5 A	3458	213810113103	RST CRB CFR-12 A 10K PM5 A
2683	203830100174	CAP PP PPN 630V S 4N7 PM5 B	3317	213810113101	RST CRB CFR-12 A 100R PM5 A	3462	213810113103	RST CRB CFR-12 A 10K PM5 A
2684	203830100208	CAP PP PPN 250V S 47N PM5 B	3318	232273061103	RST SM 0805 RC11 10K PM5 R	3464	232273061153	RST SM 0805 RC11 15K PM5 R
2685	203803521206	ELCAP GS 16V S 47U PM20 A	3319	213811203006	RST NETW RNL 5X 4K7 PM5 B	3465	213810113103	RST CRB CFR-12 A 10K PM5 A
2686	202055890557	CERHDT RR 1KV S 1N PM10 A	3326	213810113472	RST CRB CFR-12 A 4K7 PM5 A	3466	213810113103	RST CRB CFR-12 A 10K PM5 A
2691	203830100208	CAP PP PPN 250V S 47N PM5 B	3327	232273061153	RST SM 0805 RC11 15K PM5 R	3467	232273061472	RST SM 0805 RC11 4K7 PM5 R
2693	203830200226	CAP MPOL 100V S 1U8 PM5 B	3328	212211000341	RST MFLM MF1/2WS A 270R PM1 A	3468	213810113472	RST CRB CFR-12 A 4K7 PM5 A
2694	203830250212	CAP MPOL 100V S 100N PM5 A	3329	212211000317	RST MFLM MF1/2WS A 15R PM1 A	3469	213811273473	RST CRB CFR-25 A 47K PM5 A
			3330	213810113103	RST CRB CFR-12 A 10K PM5 A	3470	213810113221	RST CRB CFR-12 A 220R PM5 A
3102	232224213684	RST MGL VR37 A 680K PM5 A	3331	213810113472	RST CRB CFR-12 A 4K7 PM5 A	3471	213810113473	RST CRB CFR-12 A 47K PM5 A
3103	213866000024	NTC DC SCK-058 S 5R PM15 B	3332	213810113101	RST CRB CFR-12 A 100R PM5 A	3472	212211000396	RST MFLM MF1/2WS A 33K PM1 A
3104	213810500337	RST MOX 1W RSS A 100K PM5 A	3333	232273061103	RST SM 0805 RC11 10K PM5 R	3473	212211000383	RST MFLM MF1/2WS A 10K PM1 A
3105	213810500337	RST MOX 1W RSS A 100K PM5 A	3335	213810113101	RST CRB CFR-12 A 100R PM5 A	3474	212211000414	RST MFLM MF1/2WS A 150K PM1 A
3106	232224213224	RST MGL VR37 A 220K PM5 A	3337	213810113222	RST CRB CFR-12 A 2K2 PM5 A	3475	213811273103	RST CRB CFR-25 A 10K PM5 A
3107	232273061124	RST SM 0805 RC11 120K PM5 R	3338	213810113222	RST CRB CFR-12 A 2K2 PM5 A	3476	232224181005	RST MGL VR25 A 1M PM1 A
3109	232273061101	RST SM 0805 RC11 100R PM5 R	3340	213810113101	RST CRB CFR-12 A 100R PM5 A	3491	232273061473	RST SM 0805 RC11 47K PM5 R
3110	232224181005	RST MGL VR25 A 1M PM1 A	3341	213810113103	RST CRB CFR-12 A 10K PM5 A	3492	232273061473	RST SM 0805 RC11 47K PM5 R
3112	212010590767	RST MOX 1W RSS A 68R PM5 A	3342	212211000396	RST MFLM MF1/2WS A 33K PM1 A	3494	232273061101	RST SM 0805 RC11 100R PM5 R
3113	232224181005	RST MGL VR25 A 1M PM1 A	3343	213810113101	RST CRB CFR-12 A 100R PM5 A	3495	213810113101	RST CRB CFR-12 A 100R PM5 A
3115	212211000366	RST MFLM MF1/2WS A 2K4 PM1 A	3344	213810113101	RST CRB CFR-12 A 100R PM5 A	3501	213810500335	RST MOX5W RSM5WL S 680R PM5 B
3121	213810113152	RST CRB CFR-12 A 1K5 PM5 A	3345	213810113101	RST CRB CFR-12 A 100R PM5 A	3502	213810500442	RST MOX5W RSM5WL S 5K6 PM5 B
3122	232273091002	RST SM 0805 JUMP. MAX 0R05 R	3347	232273061472	RST SM 0805 RC11 4K7 PM5 R	3503	213810113479	RST CRB CFR-12 A 47R PM5 A
3123	212212400001	RST MPLT 5W MPR S 0R12 PM10 B	3348	213810113223	RST CRB CFR-12 A 22K PM5 A	3504	213810113103	RST CRB CFR-12 A 10K PM5 A
3124	232273091002	RST SM 0805 JUMP. MAX 0R05 R	3349	213810113223	RST CRB CFR-12 A 22K PM5 A	3505	213810500335	RST MOX5W RSM5WL S 680R PM5 B
3125	213810113102	RST CRB CFR-12 A 1K PM5 A	3350	213810113223	RST CRB CFR-12 A 22K PM5 A	3506	213810500404	RST MOX 7W RSH S 1R5 PM5 B
3128	213866000037	PTC DBL-MON0 270V 4R5 P3020 B	3361	232273091002	RST SM 0805 JUMP. MAX 0R05 R	3507	212211000327	RST MFLM MF1/2WS A 68R PM1 A
3150	213810113102	RST CRB CFR-12 A 1K PM5 A	3362	232273091002	RST SM 0805 JUMP. MAX 0R05 R	3508	213811273221	RST CRB CFR-25 A 220R PM5 A
3151	212211000407	RST MFLM MF1/2WS A 82K PM1 A	3363	232273091002	RST SM 0805 JUMP. MAX 0R05 R	3515	213810500074	RST MOX5W RSM5WL S 150R PM5 B
3152	213810113102	RST CRB CFR-12 A 1K PM5 A	3365	232273091002	RST SM 0805 JUMP. MAX 0R05 R	3516	213810500076	RST MOX5W RSM5WL S 330R PM5 B
3153	212020200015	RST FUSE RFU1/3 A 1R PM5 A	3366	232273091002	RST SM 0805 JUMP. MAX 0R05 R	3517	213810113471	RST CRB CFR-12 A 470R PM5 A
3154	213810500433	RST MGL RMU14 A 470K PM1 A	3367	232273091002	RST SM 0805 JUMP. MAX 0R05 R	3518	213810113471	RST CRB CFR-12 A 470R PM5 A
3155	232273061334	RST SM 0805 RC11 330K PM5 R	3393	232273061472	RST SM 0805 RC11 4K7 PM5 R	3519	212211000327	RST MFLM MF1/2WS A 68R PM1 A
3156	232273464702	RST SM 0805 RC12H 4K7 PM1 R	3394	232273061103	RST SM 0805 RC11 10K PM5 R	3521	212211000327	RST MFLM MF1/2WS A 68R PM1 A
3157	213836500081	RTRM CER LIN 1K H VG067TL1 B	3395	232273061472	RST SM 0805 RC11 4K7 PM5 R	3522	212211000311	RST MFLM MF1/2WS A 4R7 PM1 A

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3523	230620403159	RST FUSE NFR25 S 15R PM5 A	3630	232273061104	RST SM 0805 RC11 100K PM5 R	5543	313816873421	CENTER TRANSFORMER-SRW33IS-T20
3524	230620403159	RST FUSE NFR25 S 15R PM5 A	3631	213810113333	RST CRB CFR-12 A 33K PM5 A	5544	313811878951	H SHIFT CHOKE COIL
3525	213811273471	RST CRB CFR-25 A 470R PM5 A	3632	232273061104	RST SM 0805 RC11 100K PM5 R	5545	313812874421	PUNK HEAD CHOKE
3527	232273061103	RST SM 0805 RC11 10K PM5 R	3633	213810113333	RST CRB CFR-12 A 33K PM5 A	5601	313816873571	DAF TRANSFORMER
3528	213810113101	RST CRB CFR-12 A 100R PM5 A	3634	213811273222	RST CRB CFR-25 A 2K2 PM5 A	5670	242253597069	IND FXD SP0305 A 4U7 PM10 B
3529	213810113103	RST CRB CFR-12 A 10K PM5 A	3635	213810500409	RST MOX 2W RSS S 3K9 PM5 B	5671	313819870921	TFM LOT LAYER 13MM WIRE
3530	232273061182	RST SM 0805 RC11 1K8 PM5 R	3653	213811273129	RST CRB CFR-25 A 12R PM5 A	5672	242253600036	IND FXD TSL0808 S 100U PM10 A
3531	213811273122	RST CRB CFR-25 A 1K2 PM5 A	3656	232273061472	RST SM 0805 RC11 4K7 PM5 R			
3541	213810113109	RST CRB CFR-12 A 10R PM5 A	3658	213810113332	RST CRB CFR-12 A 3K3 PM5 A			
3542	212211000337	RST MFLM MF1/2WS A 200R PM1 A	3659	212211000376	RST MFLM MF1/2WS A 5K6 PM1 A	6021	933913910115	DIO SIG SM BAS32L (PHSE) R
3544	212211000315	RST MFLM MF1/2WS A 10R PM1 A	3660	232273061562	RST SM 0805 RC11 5K6 PM5 R	6022	933913910115	DIO SIG SM BAS32L (PHSE) R
3545	213810500095	RST MOX 7W RSH S 33R PM5 B	3661	232273061479	RST SM 0805 RC11 47R PM5 R	6101	931900263671	BRIDGE GBU6J (GI00) Y
3546	213810113479	RST CRB CFR-12 A 47R PM5 A	3662	232273061472	RST SM 0805 RC11 4K7 PM5 R	6104	933703700133	DIO REC BYV26E A (PHSE) A
3551	230620403108	RST FUSE NFR25 S 1R PM5 A	3663	232273464702	RST SM 0805 RC12H 4K7 PM1 R	6109	933117810133	DIO REG BZX79-C12 A (PHSE) A
3552	230620403108	RST FUSE NFR25 S 1R PM5 A	3664	232273061332	RST SM 0805 RC11 3K3 PM5 R	6114	933952580685	DIO SIG SM BAV103 (VISH) R
3553	212211000369	RST MFLM MF1/2WS A 3K3 PM1 A	3665	232273061103	RST SM 0805 RC11 10K PM5 R	6115	933952580685	DIO SIG SM BAV103 (VISH) R
3554	212211000385	RST MFLM MF1/2WS A 12K PM1 A	3666	232273061105	RST SM 0805 RC11 1M PM5 R	6116	933952580685	DIO SIG SM BAV103 (VISH) R
3555	232273061103	RST SM 0805 RC11 10K PM5 R	3667	232273061472	RST SM 0805 RC11 4K7 PM5 R	6117	933913910115	DIO SIG SM BAS32L (PHSE) R
3556	232273061202	RST SM 0805 RC11 2K PM5 R	3668	232273061223	RST SM 0805 RC11 22K PM5 R	6124	933497950673	DIO REC RGP10J A (VISH) A
3566	213810113472	RST CRB CFR-12 A 4K7 PM5 A	3671	232224181005	RST MGL VR25 A 1M PM1 A	6125	933913910115	DIO SIG SM BAS32L (PHSE) R
3569	212020200001	RST FUSE RFS1/2 A 1R PM5 A	3672	212020200017	RST FUSE RFU1/3 A 4R7 PM5 A	6131	932212636682	DIO REC 31DF6-FC5 (NIEC) B
3570	212211000365	RST MFLM MF1/2WS A 2K2 PM1 A	3673	232273061105	RST SM 0805 RC11 1M PM5 R	6133	932212636682	DIO REC 31DF6-FC5 (NIEC) B
3571	213811273471	RST CRB CFR-25 A 470R PM5 A	3674	212211000356	RST MFLM MF1/2WS A 1K PM1 A	6134	932208187683	DIO REC BYW98-200 (ST00) R
3572	213811273471	RST CRB CFR-25 A 470R PM5 A	3675	212211000315	RST MFLM MF1/2WS A 10R PM1 A	6135	932208187683	DIO REC BYW98-200 (ST00) R
3576	212211000365	RST MFLM MF1/2WS A 2K2 PM1 A	3676	212211000383	RST MFLM MF1/2WS A 10K PM1 A	6137	932208187683	DIO REC BYW98-200 (ST00) R
3577	212020200001	RST FUSE RFS1/2 A 1R PM5 A	3677	212010592444	RST MOX 2W RSS S 68R PM5 B	6139	933552680133	DIO REC BYV27-200 A (PHSE) A
3578	212211000325	RST MFLM MF1/2WS A 47R PM1 A	3678	213811273101	RST CRB CFR-25 A 100R PM5 A	6143	933751660673	DIO REC RGP10D A (VISH) A
3579	212211000301	RST MFLM MF1/2WS A 1R5 PM1 A	3679	213811273471	RST CRB CFR-25 A 470R PM5 A	6145	933256030673	DIO SIG 1N4148 A (VISH) A
3580	212211000304	RST MFLM MF1/2WS A 2R2 PM1 A	3680	213811273103	RST CRB CFR-25 A 10K PM5 A	6147	933957760673	DIO REC SB140 A (VISH) A
3581	212211000338	RST MFLM MF1/2WS A 220R PM1 A	3681	212211000315	RST MFLM MF1/2WS A 10R PM1 A	6148	933117760133	DIO REG BZX79-C7V5 A (PHSE) A
3582	212211000301	RST MFLM MF1/2WS A 1R5 PM1 A	3682	232224213104	RST MGL VR37 A 100K PM5 A	6149	933256030673	DIO SIG 1N4148 A (VISH) A
3585	213810113333	RST CRB CFR-12 A 33K PM5 A	3683	212010128102	RST CMP ERC12 A 1K PM10 A	6150	933117720133	DIO REG BZX79-C5V1 A (PHSE) A
3586	213810113433	RST CRB CFR-12 A 43K PM5 A	3684	212211000374	RST MFLM MF1/2WS A 4K7 PM1 A	6152	933913910115	DIO SIG SM BAS32L (PHSE) R
3587	213810113823	RST CRB CFR-12 A 82K PM5 A	3685	213811273103	RST CRB CFR-25 A 10K PM5 A	6153	932218612685	DIO SIG SM BAS82 (VISH) R
3589	213810113333	RST CRB CFR-12 A 33K PM5 A	3686	232273061272	RST SM 0805 RC11 2K7 PM5 R	6160	933913910115	DIO SIG SM BAS32L (PHSE) R
3590	212020200035	RST FUSE RFU1/3 A 43R PM5 A	3687	232273061103	RST SM 0805 RC11 10K PM5 R	6172	933117960133	DIO REG BZX79-C51 A (PHSE) A
3591	212020200035	RST FUSE RFU1/3 A 43R PM5 A	3688	232273061393	RST SM 0805 RC11 39K PM5 R	6174	933117730133	DIO REG BZX79-C5V6 A (PHSE) A
3592	212211000347	RST MFLM MF1/2WS A 470R PM1 A	3689	213810113153	RST CRB CFR-12 A 15K PM5 A	6176	933913910115	DIO SIG SM BAS32L (PHSE) R
3593	212211000466	RST MFLM MF1/2WS A 30R PM1 A	3690	213810113102	RST CRB CFR-12 A 1K PM5 A	6177	933952580685	DIO SIG SM BAV103 (VISH) R
3594	213866000029	NTC DC TTC-301 S 300R PM5 B	3691	212010128152	RST CMP ERC12 A 1K5 PM10 A	6303	932209863685	DIO SIG SM BAV99 (VISH) R
3601	232224213224	RST MGL VR37 A 220K PM5 A	3692	232224213684	RST MGL VR37 A 680K PM5 A	6304	932209863685	DIO SIG SM BAV99 (VISH) R
3602	212010592168	RST MOX 2W RSS S 10K PM5 B	3693	212211000409	RST MFLM MF1/2WS A 100K PM1 A	6391	932209863685	DIO SIG SM BAV99 (VISH) R
3604	212211000396	RST MFLM MF1/2WS A 33K PM1 A	3694	212211000407	RST MFLM MF1/2WS A 82K PM1 A	6392	932209863685	DIO SIG SM BAV99 (VISH) R
3605	232224213104	RST MGL VR37 A 100K PM5 A	3695	213836500102	RTRM CER LIN 20K H VG067TL1 B	6422	933957760673	DIO REC SB140 A (VISH) A
3606	232224213105	RST MGL VR37 A 1M PM5 A	3696	212211000436	RST MFLM MF1/2WS A 1M PM1 A	6423	933913910115	DIO SIG SM BAS32L (PHSE) R
3607	232224213105	RST MGL VR37 A 1M PM5 A	3697	212211000406	RST MFLM MF1/2WS A 75K PM1 A	6424	933256030673	DIO SIG 1N4148 A (VISH) A
3608	212211000358	RST MFLM MF1/2WS A 1K2 PM1 A	3698	213836500102	RTRM CER LIN 20K H VG067TL1 B	6426	933256030673	DIO SIG 1N4148 A (VISH) A
3609	212010128152	RST CMP ERC12 A 1K5 PM10 A	3699	232273061102	RST SM 0805 RC11 1K PM5 R	6462	933117900133	DIO REG BZX79-C30 A (PHSE) A
3612	213810113823	RST CRB CFR-12 A 82K PM5 A				6463	933913910115	DIO SIG SM BAS32L (PHSE) R
3615	212211000363	RST MFLM MF1/2WS A 1K8 PM1 A				6464	933117720133	DIO REG BZX79-C5V1 A (PHSE) A
3616	232224213475	RST MGL VR37 A 4M7 PM5 A	5101	313816873611	LINE FILTER (HJC-K8259)	6491	933256030673	DIO SIG 1N4148 A (VISH) A
3617	212010128222	RST CMP ERC12 A 2K2 PM10 A	5130	313818873531	TFM SMTLAYER SRW42ES-T71V119	6492	933256030673	DIO SIG 1N4148 A (VISH) A
3618	232273061154	RST SM 0805 RC11 150K PM5 R	5131	313818873551	TFM SMT LAYER SRW19LES-T14V115	6501	933493960673	DIO REC RGP10G A (VISH) A
3620	232273061104	RST SM 0805 RC11 100K PM5 R	5132	242253600036	IND FXD TSL0808 S 100U PM10 A	6502	933751660673	DIO REC RGP10D A (VISH) A
3621	213810113103	RST CRB CFR-12 A 10K PM5 A	5301	242253597416	IND FXD SP0406 A 33U PM10 B	6503	933256030673	DIO SIG 1N4148 A (VISH) A
3622	232273061104	RST SM 0805 RC11 100K PM5 R	5501	313819870561	TFM SIG DRIVER LS-PH03D-001	6506	933552680133	DIO REC BYV27-200 A (PHSE) A
3623	213810113103	RST CRB CFR-12 A 10K PM5 A	5502	313816874061	BEAD BF30UTA-3.5X5X1B	6507	933117850133	DIO REG BZX79-C18 A (PHSE) A
3624	232273061104	RST SM 0805 RC11 100K PM5 R	5503	313819870761	COI LINCOR 9.08UH HL2455H-085N	6515	933703700133	DIO REC BYV26E A (PHSE) A
3625	213810113103	RST CRB CFR-12 A 10K PM5 A	5504	313819870771	COI LINCOR 9.30UH HL2455H-085	6518	932218230687	DIO REC 5VUZ52 (TSOJ) L
3626	232273061104	RST SM 0805 RC11 100K PM5 R	5505	313816874061	BEAD BF30UTA-3.5X5X1B	6540	933497950673	DIO REC RGP10J A (VISH) A
3627	213810113103	RST CRB CFR-12 A 10K PM5 A	5540	313816874061	BEAD BF30UTA-3.5X5X1B	6542	933256030673	DIO SIG 1N4148 A (VISH) A
3628	232273061104	RST SM 0805 RC11 100K PM5 R	5541	313819870571	TFM SIG DRIVER LS-PH03F-004	6543	932211574682	DIO REC 31DF4-FC5 (NIEC) B
3629	213810113103	RST CRB CFR-12 A 10K PM5 A	5542	242253600036	IND FXD TSL0808 S 100U PM10 A	6544	933751660673	DIO REC RGP10D A (VISH) A

6545	933751660673	DIO REC RGP10D	A (VISH) A	7566	932209265685	TRA SIG SM MUN2211J (ONSE) R	2752	202203100228	ELCAP KM 100V S 47U PM20 B
6566	933256030673	DIO SIG 1N4148	A (VISH) A	7567	931900234682	IC STV9379 (ST00) L	2753	202203100224	ELCAP KM 250V S 1U PM20 A
6567	933504400673	DIO REC RGP15G	A (GI00) A	7586	933984890682	IC LM358N (ST00) L	2756	223886115101	CER1 0805 NP0 50V 100P PM5 R
6601	933724630113	DIO REC BY614	A (PHSE) R	7587	933221930126	TRA SIG BC637 (PHSE) A	2757	223886115101	CER1 0805 NP0 50V 100P PM5 R
6603	933724630113	DIO REC BY614	A (PHSE) R	7588	933221960126	TRA SIG BC638 (PHSE) A	2760	223891015649	CER2 0805 X7R 25V 100N PM10 R
6621	933256030673	DIO SIG 1N4148	A (VISH) A	7601	932206519687	TRA POW BUX87 (ST00) L	2761	202055800006	CER2 DC E 2KV S 10N P8020 B
6622	933117720133	DIO REG BZX79-C5V1	A (PHSE) A	7620	932217996687	FET POW IRF640B (FSC0) L	2762	225260214416	CER2 DC X7R 2KV S 470P PM10 A
6651	933751660673	DIO REC RGP10D	A (VISH) A	7621	932217996687	FET POW IRF640B (FSC0) L	2763	225261818021	CER2 DC Y5P 500V S 1N PM10 B
6652	933117720133	DIO REG BZX79-C5V1	A (PHSE) A	7622	932214562667	FET POW SLA5085 (SAKJ) L	2764	202055890557	CERHDT RR 1KV S 1N PM10 A
6653	933913910115	DIO SIG SM BAS32L (PHSE) R		7627	932209265685	TRA SIG SM MUN2211J (ONSE) R	2765	225260215216	CER2 DC X7R 2KV S 220P PM10 B
6654	933913910115	DIO SIG SM BAS32L (PHSE) R		7628	932209265685	TRA SIG SM MUN2211J (ONSE) R	2766	223858015632	CER2 0805 X7R 50V 4N7 PM10 R
6655	933117720133	DIO REG BZX79-C5V1	A (PHSE) A	7629	932209265685	TRA SIG SM MUN2211J (ONSE) R	2767	223891015649	CER2 0805 X7R 25V 100N PM10 R
6656	933913910115	DIO SIG SM BAS32L (PHSE) R		7630	932209265685	TRA SIG SM MUN2211J (ONSE) R	2768	223891015649	CER2 0805 X7R 25V 100N PM10 R
6671	933497950673	DIO REC RGP10J	A (VISH) A	7631	932209265685	TRA SIG SM MUN2211J (ONSE) R	2770	203803527501	ELCAP KM 50V S 10U PM20 A
6672	932219826682	DIO REC 31DF6-FC (NIEC) B		7632	932209265685	TRA SIG SM MUN2211J (ONSE) R	2771	223891015649	CER2 0805 X7R 25V 100N PM10 R
6673	933751660673	DIO REC RGP10D	A (VISH) A	7633	932209265685	TRA SIG SM MUN2211J (ONSE) R	2772	203803527303	ELCAP KM 25V S 47U PM20 A
6674	933612320113	DIO REC BY584	A (PHSE) R	7651	932212152682	IC L4990A (ST00) L	2773	223891015649	CER2 0805 X7R 25V 100N PM10 R
7121	932214039682	IC STR-F6456(LF1352) (SAKJ) B		7652	932209011673	TRA SIG BC548C (KEC0) A	2774	223891015649	CER2 0805 X7R 25V 100N PM10 R
7122	933967380685	TRA SIG SM BC858C (ONSE) R		7653	933967380685	TRA SIG SM BC858C (ONSE) R	2775	203803527204	ELCAP KM 16V S 330U PM20 A
7130	932214014667	OPT CP TCET1103(G) (VISH) L		7654	933967310685	TRA SIG SM BC848C (ONSE) R	2776	223891015649	CER2 0805 X7R 25V 100N PM10 R
7132	933567120126	TRA SIG BC516 (PHSE) A		7671	934003960126	FET SIG BSN254A (PHSE) A	2777	203803527303	ELCAP KM 25V S 47U PM20 A
7133	932206519687	TRA POW BUX87 (ST00) L		7672	932217890687	FET POW IRF740B (FSC0) L	2778	223891015649	CER2 0805 X7R 25V 100N PM10 R
7134	933953420676	TRA SIG TBC338-40 (TOSJ) A		7673	932216023687	FET POW STP7NB80 (ST00) L	2779	202203100228	ELCAP KM 100V S 47U PM20 B
7135	932214014667	OPT CP TCET1103(G) (VISH) L		7674	932209011673	TRA SIG BC548C (KEC0) A	2780	203803250095	CAP MPOL 100V S 100N PM10 A
7143	932209200687	IC L4940V5 (ST00) L		8001	313816873032	CBLE 330919 10P/430/11P 330991	2781	202203100224	ELCAP KM 250V S 1U PM20 A
7144	932209011673	TRA SIG BC548C (KEC0) A		8002	313816873011	CBLE 330941 11P/430/12P 330992	2782	203803250166	CAP MPOL 400V S 10N PM10 A
7145	932209265685	TRA SIG SM MUN2211J (ONSE) R		8003	313816875752	WIRE HARNES 10P+11P(41530)	2783	223886115229	CER1 0805 NP0 50V 22P PM5 R
7155	932208367676	IC TL431CZ S (ST00) A		8004	313816874791	CBLE 330938 9P/450/9P 330988	2784	223886115229	CER1 0805 NP0 50V 22P PM5 R
7161	933953420676	TRA SIG TBC338-40 (TOSJ) A		8101	313816878092	MHR 3P WIRE HAENESS	2785	223886115229	CER1 0805 NP0 50V 22P PM5 R
7301	823827445611	CPU,IC (6148-K420PH-85A)		8103	313816878081	MHR 2P+2P WIRE HAENESS	2786	223886115229	CER1 0805 NP0 50V 22P PM5 R
7302	933967380685	TRA SIG SM BC858C (ONSE) R		8672	313816875071	CBLE FAST 115/2P FAST-RING	2787	223891015649	CER2 0805 X7R 25V 100N PM10 R
7303	933967310685	TRA SIG SM BC848C (ONSE) R		8701	313819870311	CBLE-885T 6/215/6-915 AWG28	2788	223891015649	CER2 0805 X7R 25V 100N PM10 R
7304	932209265685	TRA SIG SM MUN2211J (ONSE) R		8702	313818873621	CBLE RING TERM/80/CLIP BRAID	2789	223886115101	CER1 0805 NP0 50V 100P PM5 R
7336	932212662682	IC M24C16-BN6 (ST00) L		8891	313819871161	CBLE-936 7/300/7-856T AWG24	2790	223886115101	CER1 0805 NP0 50V 100P PM5 R
7363	933400610682	IC MC7812CT (MOTA) B					2791	203803527202	ELCAP KM 16V S 100U PM20 A
7364	933920810682	IC L7808CV (ST00) L		1161	313817867431	VIDEO BOARD ASSY(DELL)	2792	223858015632	CER2 0805 X7R 50V 4N7 PM10 R
7391	932209265685	TRA SIG SM MUN2211J (ONSE) R					2793	223886115101	CER1 0805 NP0 50V 100P PM5 R
7392	933967380685	TRA SIG SM BC858C (ONSE) R					2797	203803250166	CAP MPOL 400V S 10N PM10 A
7404	933282660652	IC HEF4053BP (PHSE) L		2702	223858015636	CER2 0805 X7R 50V 10N PM10 R	2798	203803527202	ELCAP KM 16V S 100U PM20 A
7421	935267452112	IC TDA4856/V3 (PHSE) L		2704	203803522801	ELCAP BP NK 160V S 1U PM20 A	2799	223891015649	CER2 0805 X7R 25V 100N PM10 R
7422	933953420676	TRA SIG TBC338-40 (TOSJ) A		2705	202203100224	ELCAP KM 250V S 1U PM20 A	2811	202203100224	ELCAP KM 250V S 1U PM20 A
7423	933953410676	TRA SIG TBC328-40 (TOSJ) A		2706	242254944346	SURGE PROTECT DSP-201M-D04F			
7424	932209265685	TRA SIG SM MUN2211J (ONSE) R		2707	223891015649	CER2 0805 X7R 25V 100N PM10 R			
7425	932209011673	TRA SIG BC548C (KEC0) A		2708	223891015649	CER2 0805 X7R 25V 100N PM10 R	3701	232273467509	RST SM 0805 RC12H 75R PM1 R
7426	932210142676	TRA SIG BC558C (KEC0) A		2709	223891015649	CER2 0805 X7R 25V 100N PM10 R	3702	232273061479	RST SM 0805 RC11 47R PM5 R
7427	933967380685	TRA SIG SM BC858C (ONSE) R		2710	223886115279	CER1 0805 NP0 50V 27P PM5 R	3703	232273061229	RST SM 0805 RC11 22R PM5 R
7461	933237780126	TRA SIG BC546B (PHSE) A		2720	223886115279	CER1 0805 NP0 50V 27P PM5 R	3704	232273061689	RST SM 0805 RC11 68R PM5 R
7462	932209011673	TRA SIG BC548C (KEC0) A		2722	223858015636	CER2 0805 X7R 50V 10N PM10 R	3705	232273061105	RST SM 0805 RC11 1M PM5 R
7463	932210142676	TRA SIG BC558C (KEC0) A		2724	203803522801	ELCAP BP NK 160V S 1U PM20 A	3706	212211000403	RST MFLM MF1/2WS A 56K PM1 A
7464	932214472676	TRA SIG BF423 (KEC0) A		2725	202203100224	ELCAP KM 250V S 1U PM20 A	3707	213810113224	RST CRB CFR-12 A 220K PM5 A
7465	932214469676	TRA SIG BF422 (KEC0) A		2726	242254944346	SURGE PROTECT DSP-201M-D04F	3708	232273061823	RST SM 0805 RC11 82K PM5 R
7466	932209265685	TRA SIG SM MUN2211J (ONSE) R		2727	223891015649	CER2 0805 X7R 25V 100N PM10 R	3709	212010128479	RST CMP ERC12 A 47R PM10 A
7491	932215333682	IC M24C02-BN6 (ST00) L		2736	223858019814	CER2 0805 Y5V 50V 220N P8020 R	3710	232273061102	RST SM 0805 RC11 1K PM5 R
7501	934000540115	FET SIG SM BSP126 (PHSE) R		2740	223886115279	CER1 0805 NP0 50V 27P PM5 R	3711	232273061123	RST SM 0805 RC11 12K PM5 R
7502	932217972682	TRA POW 2SC5570 (TOSJ) L		2742	223858015636	CER2 0805 X7R 50V 10N PM10 R	3712	232273061102	RST SM 0805 RC11 1K PM5 R
7503	932205702687	TRA POW BD533 (ST00) L		2744	203803522801	ELCAP BP NK 160V S 1U PM20 A	3713	232273061101	RST SM 0805 RC11 100R PM5 R
7504	932205703687	TRA POW BD534 (ST00) L		2745	202203100224	ELCAP KM 250V S 1U PM20 A	3714	232273061101	RST SM 0805 RC11 100R PM5 R
7505	933984890682	IC LM358N (ST00) L		2746	242254944346	SURGE PROTECT DSP-201M-D04F	3715	232273061101	RST SM 0805 RC11 100R PM5 R
7541	932218090687	TRANS IRF730B		2748	203803527303	ELCAP KM 25V S 47U PM20 A	3717	232273061471	RST SM 0805 RC11 470R PM5 R
7542	932204822682	TRA POW 2SC2344E (TSAJ) B		2749	223891015649	CER2 0805 X7R 25V 100N PM10 R	3718	232273061471	RST SM 0805 RC11 470R PM5 R
7543	932204823682	TRA POW 2SA1011E (TSAJ) B		2750	223891015649	CER2 0805 X7R 25V 100N PM10 R	3721	232273467509	RST SM 0805 RC12H 75R PM1 R
7544	933967380685	TRA SIG SM BC858C (ONSE) R		2751	223891015649	CER2 0805 X7R 25V 100N PM10 R	3722	232273061479	RST SM 0805 RC11 47R PM5 R
7545	932214469676	TRA SIG BF422 (KEC0) A					3723	232273061229	RST SM 0805 RC11 22R PM5 R

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3724	232273061689	RST SM 0805 RC11	68R PM5 R	5737	242254944197	IND FXD 0805 EMI 100MHZ 220R R	2010	223891015649	CER2 0805 X7R 25V	100N PM10 R
3725	232273061105	RST SM 0805 RC11	1M PM5 R	5760	313816874511	FERRITE BEAD	2011	202202000886	ELCAP SH	16V S 47U PM20 A
3726	212211000403	RST MFLM MF1/2WS A	56K PM1 A	5761	242254944197	IND FXD 0805 EMI 100MHZ 220R R	2013	202202000886	ELCAP SH	16V S 47U PM20 A
3727	213810113224	RST CRB CFR-12	A 220K PM5 A	5762	242254944197	IND FXD 0805 EMI 100MHZ 220R R	2017	223891015649	CER2 0805 X7R 25V	100N PM10 R
3728	232273061823	RST SM 0805 RC11	82K PM5 R	5763	242254944197	IND FXD 0805 EMI 100MHZ 220R R	2018	223886115109	CER1 0805 NP0 50V	10P PM5 R
3729	212010128479	RST CMP ERC12	A 47R PM10 A	5764	242254944197	IND FXD 0805 EMI 100MHZ 220R R	2019	223886115109	CER1 0805 NP0 50V	10P PM5 R
3730	232273061102	RST SM 0805 RC11	1K PM5 R	5765	242254944197	IND FXD 0805 EMI 100MHZ 220R R	2020	223886115109	CER1 0805 NP0 50V	10P PM5 R
3731	232273061123	RST SM 0805 RC11	12K PM5 R	5766	242253597069	IND FXD SP0305 A 4U7 PM10 B	2021	223886115109	CER1 0805 NP0 50V	10P PM5 R
3732	232273061222	RST SM 0805 RC11	2K2 PM5 R	5767	313816874511	FERRITE BEAD	2022	223891015649	CER2 0805 X7R 25V	100N PM10 R
3733	232273061181	RST SM 0805 RC11	180R PM5 R	5768	242254942026	IND FXD BEAD EMI 100MHZ 50R A	2023	202202000884	ELCAP SH	10V S 220U PM20 A
3734	232273061101	RST SM 0805 RC11	100R PM5 R	5781	242253597069	IND FXD SP0305 A 4U7 PM10 B	2024	223891015649	CER2 0805 X7R 25V	100N PM10 R
3735	232273061471	RST SM 0805 RC11	470R PM5 R	5782	242253597069	IND FXD SP0305 A 4U7 PM10 B	2025	202202000884	ELCAP SH	10V S 220U PM20 A
3736	232273061101	RST SM 0805 RC11	100R PM5 R	5783	313817878601	BEAD 07UH VERT.	2026	223886115339	CER1 0805 NP0 50V	33P PM5 R
3737	232273061105	RST SM 0805 RC11	1M PM5 R	5791	242253597069	IND FXD SP0305 A 4U7 PM10 B	2027	202202000884	ELCAP SH	10V S 220U PM20 A
3738	232273061105	RST SM 0805 RC11	1M PM5 R	5801	242254944197	IND FXD 0805 EMI 100MHZ 220R R	2028	223886115339	CER1 0805 NP0 50V	33P PM5 R
3741	232273467509	RST SM 0805 RC12H	75R PM1 R	5891	242254944197	IND FXD 0805 EMI 100MHZ 220R R	2029	223891015649	CER2 0805 X7R 25V	100N PM10 R
3742	232273061479	RST SM 0805 RC11	47R PM5 R				2030	223891015649	CER2 0805 X7R 25V	100N PM10 R
3743	232273061229	RST SM 0805 RC11	22R PM5 R	6701	933952580685	DIO SIG SM BAV103 (VISH) R	2031	223886115229	CER1 0805 NP0 50V	22P PM5 R
3744	232273061689	RST SM 0805 RC11	68R PM5 R	6702	933952580685	DIO SIG SM BAV103 (VISH) R	2032	223886115229	CER1 0805 NP0 50V	22P PM5 R
3745	232273061105	RST SM 0805 RC11	1M PM5 R	6703	933952580685	DIO SIG SM BAV103 (VISH) R	2033	223886115229	CER1 0805 NP0 50V	22P PM5 R
3746	212211000403	RST MFLM MF1/2WS A	56K PM1 A	6704	933952580685	DIO SIG SM BAV103 (VISH) R	2034	223886115229	CER1 0805 NP0 50V	22P PM5 R
3747	213810113224	RST CRB CFR-12	A 220K PM5 A	6705	933913910115	DIO SIG SM BAS32L (PHSE) R	2035	223891015649	CER2 0805 X7R 25V	100N PM10 R
3748	232273061823	RST SM 0805 RC11	82K PM5 R	6721	933952580685	DIO SIG SM BAV103 (VISH) R	2036	223891015649	CER2 0805 X7R 25V	100N PM10 R
3749	212010128479	RST CMP ERC12	A 47R PM10 A	6722	933952580685	DIO SIG SM BAV103 (VISH) R	2037	223891019854	CER2 0805 Y5V 25V 220N P8020 R	
3750	232273061102	RST SM 0805 RC11	1K PM5 R	6723	933952580685	DIO SIG SM BAV103 (VISH) R	2038	223891015649	CER2 0805 X7R 25V	100N PM10 R
3751	232273061123	RST SM 0805 RC11	12K PM5 R	6724	933952580685	DIO SIG SM BAV103 (VISH) R				
3755	232273091002	RST SM 0805 JUMP.	MAX 0R05 R	6725	933913910115	DIO SIG SM BAS32L (PHSE) R	3001	232273061222	RST SM 0805 RC11	2K2 PM5 R
3760	212010128153	RST CMP ERC12	A 15K PM10 A	6731	933913910115	DIO SIG SM BAS32L (PHSE) R	3002	232273061479	RST SM 0805 RC11	47R PM5 R
3761	212211000387	RST MFLM MF1/2WS A	15K PM1 A	6732	932209863685	DIO SIG SM BAV99 (VISH) R	3003	232273061479	RST SM 0805 RC11	47R PM5 R
3763	212010128152	RST CMP ERC12	A 1K5 PM10 A	6741	933952580685	DIO SIG SM BAV103 (VISH) R	3004	232273061222	RST SM 0805 RC11	2K2 PM5 R
3765	212211000416	RST MFLM MF1/2WS A	180K PM1 A	6742	933952580685	DIO SIG SM BAV103 (VISH) R	3005	232273467509	RST SM 0805 RC12H	75R PM1 R
3766	232273061101	RST SM 0805 RC11	100R PM5 R	6743	933952580685	DIO SIG SM BAV103 (VISH) R	3009	232273467509	RST SM 0805 RC12H	75R PM1 R
3767	232273061101	RST SM 0805 RC11	100R PM5 R	6744	933952580685	DIO SIG SM BAV103 (VISH) R	3010	232273061479	RST SM 0805 RC11	47R PM5 R
3768	232273061102	RST SM 0805 RC11	1K PM5 R	6745	933913910115	DIO SIG SM BAS32L (PHSE) R	3011	232273467509	RST SM 0805 RC12H	75R PM1 R
3769	232273061152	RST SM 0805 RC11	1K5 PM5 R	6761	933493960673	DIO REC RGP10G A (VISH) A	3012	232273061471	RST SM 0805 RC11	470R PM5 R
3783	232273061102	RST SM 0805 RC11	1K PM5 R	6762	933500820133	DIO REG BZV85-C51 A (PHSE) A	3013	232273061471	RST SM 0805 RC11	470R PM5 R
3785	232273061102	RST SM 0805 RC11	1K PM5 R	6891	932214603682	LED VS L-3WYGW (KIEL) B	3014	232273061471	RST SM 0805 RC11	470R PM5 R
3786	232273061103	RST SM 0805 RC11	10K PM5 R				3015	232273061471	RST SM 0805 RC11	470R PM5 R
3787	232273061332	RST SM 0805 RC11	3K3 PM5 R	7701	935264061112	IC TDA4887PS/V1 (PHSE) L	3016	232273061479	RST SM 0805 RC11	47R PM5 R
3788	232273061101	RST SM 0805 RC11	100R PM5 R	7705	932220610682	IC LM2412T (NSCO) L	3017	232273467509	RST SM 0805 RC12H	75R PM1 R
3789	232273061101	RST SM 0805 RC11	100R PM5 R	7706	932214469676	TRA SIG BF422 (KECO) A	3018	232273061222	RST SM 0805 RC11	2K2 PM5 R
3790	232273061103	RST SM 0805 RC11	10K PM5 R	7707	932214469676	TRA SIG BF422 (KECO) A	3019	232273061479	RST SM 0805 RC11	47R PM5 R
3791	232273061332	RST SM 0805 RC11	3K3 PM5 R	7726	932214469676	TRA SIG BF422 (KECO) A	3020	232273467509	RST SM 0805 RC12H	75R PM1 R
3792	232273464702	RST SM 0805 RC12H	4K7 PM1 R	7727	932214469676	TRA SIG BF422 (KECO) A	3021	232273061479	RST SM 0805 RC11	47R PM5 R
3793	232273061622	RST SM 0805 RC11	6K2 PM5 R	7746	932214469676	TRA SIG BF422 (KECO) A	3022	232273467509	RST SM 0805 RC12H	75R PM1 R
3814	232273091002	RST SM 0805 JUMP.	MAX 0R05 R	7747	932214469676	TRA SIG BF422 (KECO) A	3023	232273061222	RST SM 0805 RC11	2K2 PM5 R
3824	232273091002	RST SM 0805 JUMP.	MAX 0R05 R	7781	823827445601	OSD,IC (6805-N160PH-17A)	3024	232273061221	RST SM 0805 RC11	220R PM5 R
3834	232273091002	RST SM 0805 JUMP.	MAX 0R05 R	7782	932209265685	TRA SIG SM MUN2211J (ONSE) R	3026	232273061101	RST SM 0805 RC11	100R PM5 R
				7783	932209265685	TRA SIG SM MUN2211J (ONSE) R	3027	232273061101	RST SM 0805 RC11	100R PM5 R
5701	242253597069	IND FXD SP0305 A	4U7 PM10 B	7891	932213999682	IC LM61BIZ (NSCO) B	3028	232273061473	RST SM 0805 RC11	47K PM5 R
5702	313817876911	COIL 0.12UH PM10		1162	313817867441	TERMIAL PCB ASSY(DELL)	3029	232273061473	RST SM 0805 RC11	47K PM5 R
5703	242254944197	IND FXD 0805 EMI 100MHZ 220R R								
5704	313816879121	FERRITE BEAD SMD (FB423226T-Y7		2001	202202000884	ELCAP SH	5001	242253597069	IND FXD SP0305 A	4U7 PM10 B
5721	313817876911	COIL 0.12UH PM10		2002	202202000885	ELCAP SH	5002	242253597069	IND FXD SP0305 A	4U7 PM10 B
5722	242254944197	IND FXD 0805 EMI 100MHZ 220R R		2003	202202000886	ELCAP SH	5003	242253597069	IND FXD SP0305 A	4U7 PM10 B
5731	313817876911	COIL 0.12UH PM10		2004	202202000886	ELCAP SH	5021	242254944197	IND FXD 0805 EMI 100MHZ 220R R	
5732	242254944197	IND FXD 0805 EMI 100MHZ 220R R		2005	202202000886	ELCAP SH				
5733	242254944197	IND FXD 0805 EMI 100MHZ 220R R		2007	202202000886	ELCAP SH	7001	932214260682	IC AN5870 (MATJ) L	
5734	242253597069	IND FXD SP0305 A	4U7 PM10 B	2008	223891015649	CER2 0805 X7R 25V	7021	932215333682	IC M24C02-BN6 (ST00) L	
5735	242254944197	IND FXD 0805 EMI 100MHZ 220R R								
5736	242254944197	IND FXD 0805 EMI 100MHZ 220R R								

1163	313817867451	CONTROL PCB ASSY(DELL)	3219	212211000458	RST MFLM MF1/2WS A 21K PM1 A	7201	932213999682	IC LM61BIZ (NSC0) B
			3220	212211000374	RST MFLM MF1/2WS A 4K7 PM1 A	7203	933984890682	IC LM358N (ST00) L
1891	243812800196	SWI TACT H=5 GY 160G SKHHAM	3221	212211000468	RST MFLM MF1/2WS A 127K PM1 A	7204	932220364682	IC WT61P4-K420WT-000 (WESE) L
1892	243812800196	SWI TACT H=5 GY 160G SKHHAM	3222	212211000387	RST MFLM MF1/2WS A 15K PM1 A	7206	935262849112	IC TDA7073A/N4 (PHSE) L
1893	243812800196	SWI TACT H=5 GY 160G SKHHAM	3223	212211000469	RST MFLM MF1/2WS A 137K PM1 A	7207	935262849112	IC TDA7073A/N4 (PHSE) L
1894	243812800196	SWI TACT H=5 GY 160G SKHHAM	3224	212211000387	RST MFLM MF1/2WS A 15K PM1 A	7209	935262849112	IC TDA7073A/N4 (PHSE) L
1895	243812800196	SWI TACT H=5 GY 160G SKHHAM	3225	212211000469	RST MFLM MF1/2WS A 137K PM1 A			
			3230	213811273103	RST CRB CFR-25 A 10K PM5 A	1165	313817867301	MHR PCB ASSY
			3231	213811273103	RST CRB CFR-25 A 10K PM5 A			
2891	223891015649	CER2 0805 X7R 25V 100N PM10 R	3238	212211000401	RST MFLM MF1/2WS A 47K PM1 A			
2892	223891015649	CER2 0805 X7R 25V 100N PM10 R	3239	212211000401	RST MFLM MF1/2WS A 47K PM1 A	2192	203803521502	ELCAP GS 50V S 22U PM20 A
2893	223891015649	CER2 0805 X7R 25V 100N PM10 R	3241	212211000392	RST MFLM MF1/2WS A 22K PM1 A	2193	203803521603	ELCAP GS 63V S 22U PM20 A
2894	223858015636	CER2 0805 X7R 50V 10N PM10 R	3242	212211000392	RST MFLM MF1/2WS A 22K PM1 A	2194	203803521209	ELCAP GS 16V S 220U PM20 A
2895	223858015636	CER2 0805 X7R 50V 10N PM10 R	3243	212211000392	RST MFLM MF1/2WS A 22K PM1 A	2195	222236555223	CAP MPOL 400V S 22N PM10 A
			3244	212211000392	RST MFLM MF1/2WS A 22K PM1 A	3191	212211000382	RST MFLM MF1/2WS A 9K1 PM1 A
			3246	212211000392	RST MFLM MF1/2WS A 22K PM1 A	3192	212211000385	RST MFLM MF1/2WS A 12K PM1 A
3891	212211000409	RST MFLM MF1/2WS A 100K PM1 A	3247	212211000392	RST MFLM MF1/2WS A 22K PM1 A			
3892	212211000403	RST MFLM MF1/2WS A 56K PM1 A	3248	212211000361	RST MFLM MF1/2WS A 1K5 PM1 A			
3893	212211000374	RST MFLM MF1/2WS A 4K7 PM1 A	3249	212211000413	RST MFLM MF1/2WS A 130K PM1 A	5191	313816872691	MAINS HARMONIC COIL
3894	212211000387	RST MFLM MF1/2WS A 15K PM1 A	3250	212211000386	RST MFLM MF1/2WS A 13K PM1 A	5192	243853598058	IND FXD BEAD EMI 100MHZ 80R A
3895	212211000393	RST MFLM MF1/2WS A 24K PM1 A	3251	212211000413	RST MFLM MF1/2WS A 130K PM1 A			
3919	232273091002	RST SM 0805 JUMP. MAX 0R05 R	3252	212211000384	RST MFLM MF1/2WS A 11K PM1 A			
			3253	212211000413	RST MFLM MF1/2WS A 130K PM1 A	6191	933256030673	DIO SIG 1N4148 A (VISH) A
1164	313817867291	DRIVER PCB ASSY	3254	212211000386	RST MFLM MF1/2WS A 13K PM1 A	6192	933189210133	DIO SIG BAV21 A (PHSE) A
			3255	212211000413	RST MFLM MF1/2WS A 130K PM1 A	6193	933189210133	DIO SIG BAV21 A (PHSE) A
			3256	212211000384	RST MFLM MF1/2WS A 11K PM1 A	6194	933256030673	DIO SIG 1N4148 A (VISH) A
2201	225232512103	CER2 ML X7R 50V S 10N PM10 A	3257	212211000413	RST MFLM MF1/2WS A 130K PM1 A	7191	933953420676	TRA SIG TBC338-40 (TOSJ) A
2202	203803521308	ELCAP GS 25V S 100U PM20 A	3258	212211000386	RST MFLM MF1/2WS A 13K PM1 A			
2209	203803521308	ELCAP GS 25V S 100U PM20 A	3259	212211000413	RST MFLM MF1/2WS A 130K PM1 A			
2213	225232512103	CER2 ML X7R 50V S 10N PM10 A	3260	212211000384	RST MFLM MF1/2WS A 11K PM1 A			
2214	203803521206	ELCAP GS 16V S 47U PM20 A	3261	212211000413	RST MFLM MF1/2WS A 130K PM1 A			
2215	225279508453	CER2 DC Y5V 50V 100N P8020 A	3262	212211000386	RST MFLM MF1/2WS A 13K PM1 A			
2216	203803521206	ELCAP GS 16V S 47U PM20 A	3263	212211000413	RST MFLM MF1/2WS A 130K PM1 A			
2217	225279508453	CER2 DC Y5V 50V 100N P8020 A	3264	212211000384	RST MFLM MF1/2WS A 11K PM1 A			
2218	203803521206	ELCAP GS 16V S 47U PM20 A	3269	212211000413	RST MFLM MF1/2WS A 130K PM1 A			
2219	202055290594	CER1 DC NP0 50V S 22P PM5 A	3270	212211000378	RST MFLM MF1/2WS A 6K8 PM1 A			
2220	202055290594	CER1 DC NP0 50V S 22P PM5 A	3271	212211000413	RST MFLM MF1/2WS A 130K PM1 A			
2229	225232512103	CER2 ML X7R 50V S 10N PM10 A	3272	212211000376	RST MFLM MF1/2WS A 5K6 PM1 A			
2230	202202000878	ELCAP GS 16V S 22U PM20 A	3273	212211000413	RST MFLM MF1/2WS A 130K PM1 A			
2231	202202000878	ELCAP GS 16V S 22U PM20 A	3274	212211000378	RST MFLM MF1/2WS A 6K8 PM1 A			
2239	203803521311	ELCAP GS 25V S 470U PM20 B	3275	212211000413	RST MFLM MF1/2WS A 130K PM1 A			
2241	203803521301	ELCAP GS 25V S 2U2 PM20 A	3276	212211000376	RST MFLM MF1/2WS A 5K6 PM1 A			
2242	203803521301	ELCAP GS 25V S 2U2 PM20 A	3277	212211000321	RST MFLM MF1/2WS A 22R PM1 A			
2243	203803521301	ELCAP GS 25V S 2U2 PM20 A	3278	212211000321	RST MFLM MF1/2WS A 22R PM1 A			
2244	203803521301	ELCAP GS 25V S 2U2 PM20 A	3280	212211000321	RST MFLM MF1/2WS A 22R PM1 A			
2246	203803521301	ELCAP GS 25V S 2U2 PM20 A	3281	212211000321	RST MFLM MF1/2WS A 22R PM1 A			
2247	203803521301	ELCAP GS 25V S 2U2 PM20 A	3283	212211000321	RST MFLM MF1/2WS A 22R PM1 A			
2248	202202000878	ELCAP GS 16V S 22U PM20 A	3284	212211000321	RST MFLM MF1/2WS A 22R PM1 A			
2249	203803521311	ELCAP GS 25V S 470U PM20 B	3286	212211000321	RST MFLM MF1/2WS A 22R PM1 A			
2250	203803521311	ELCAP GS 25V S 470U PM20 B	3287	212211000321	RST MFLM MF1/2WS A 22R PM1 A			
2251	203803521311	ELCAP GS 25V S 470U PM20 B	3292	212211000327	RST MFLM MF1/2WS A 68R PM1 A			
2252	203803521215	ELCAP GS 16V S 470U PM20 B	3293	212211000327	RST MFLM MF1/2WS A 68R PM1 A			
			3295	212211000327	RST MFLM MF1/2WS A 68R PM1 A			
			3296	212211000327	RST MFLM MF1/2WS A 68R PM1 A			
3201	212010592397	RST MOX 3W RSS S 120R PM5 B						
3204	212211000366	RST MFLM MF1/2WS A 2K4 PM1 A						
3205	212211000456	RST MFLM MF1/2WS A 91R PM1 A	6201	933166890133	DIO REG BZX79-B12 A (PHSE) A			
3206	212211000366	RST MFLM MF1/2WS A 2K4 PM1 A	6202	933549930133	DIO REG BZX79-B2V4 A (PHSE) A			
3207	212211000332	RST MFLM MF1/2WS A 120R PM1 A	6203	933256030673	DIO SIG 1N4148 A (VISH) A			
3210	212211000356	RST MFLM MF1/2WS A 1K PM1 A	6204	933256030673	DIO SIG 1N4148 A (VISH) A			
3217	212211000458	RST MFLM MF1/2WS A 21K PM1 A	6207	933117730133	DIO REG BZX79-C5V6 A (PHSE) A			
3218	212211000468	RST MFLM MF1/2WS A 127K PM1 A	6208	933117730133	DIO REG BZX79-C5V6 A (PHSE) A			

Safety test requirements

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All units that are returned for service or repair must pass the original manufactures safety tests. Safety testing requires both Hipot and Ground Continuity testing.

HI-POT TEST INSTRUCTION

1. Application requirements

- 1.1 All mains operated products must pass the Hi-Pot test as described in this instruction.
- 1.2 This test must be performed again after the covers have been refitted following the repair, inspection or modification of the product.

2. Test method

2.1 Connecting conditions

- 2.1.1 The test specified must be applied between the parallel-blade plug of the mainscord and all accessible metal parts of the product.
- 2.1.2 Before carrying out the test, reliable conductive connections must be ensured and thereafter be maintained throughout the test period.
- 2.1.3 The mains switch(es) must be in the "ON" position.

2.2 Test Requirements

All products should be HiPot and Ground Continuity tested as follows:

Condition	HiPot Test for products where the mains input range is Full range(or 220V AC)	HiPot Test for products where the mains input is 110V AC(USA type)	Ground Continuity Test requirement
Test voltage	2820VDC (2000VAC)	1700VDC (1200VAC)	Test current: 25A,AC Test time: 3 seconds(min.) Resistance required: $\leq 0.09 + R_{ohm}$, R is the resistance of the mains cord.
Test time (min.)	3 seconds	1 second	
Trip current (Tester)	set at 100 uA for Max. limitation; set at 0.1 uA for Min. Limitation	5 mA	
Ramp time (Tester)	set at 2 seconds		

- 2.2.1 The test with AC voltage is only for production purpose, Service center shall use DC voltage.
- 2.2.2 The minimum test duration for Quality Control Inspector must be 1 minute. No breakdown during the test.
- 2.2.3 The test voltage must be maintained within the specified voltage + 5%.
- 2.2.4 The grounding blade or pin of mains plug must be conducted with accessible metal parts.

3. Equipments and Connection

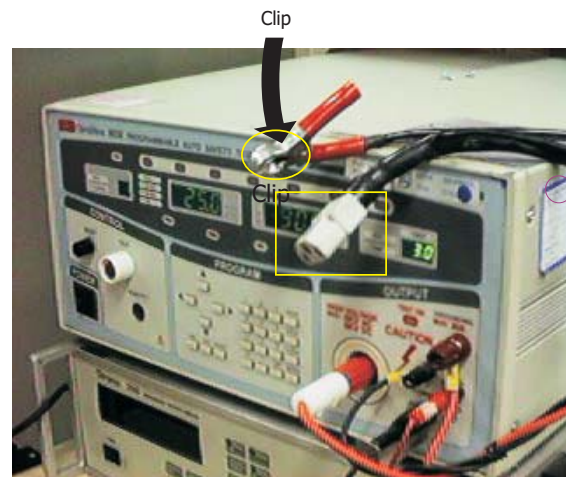
3.1. Equipments

For example :

- ChenHwa 9032 PROGRAMMABLE AUTO SAFETY TESTER
- ChenHwa 510B Digital Grounding Continuity Tester
- ChenHwa 901 (AC Hi-pot test), 902 (AC, DC Hi-pot test) Withstanding Tester

3.2. Connection

- * Turn on the power switch of monitor before Hipot and Ground Continuity testing.



(ChenHwa 9032 tester)

Video cable



Grounding screw



Power outlet

(Rear view of monitor)

4. Recording

Hipot and Ground Continuity testing records have to be kept for a period of 10 years.

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**M25P Dell P1230 SH590
GENERAL PRODUCT
SPECIFICATION**

- . MICRO PROCESSOR-BASED DIGITAL CONTROL WITH 32 FACTORY MODES, 9 PRESET MODES AND 16 USER MODES TO ENSURE PICTURE CONFIGURATIONS ARE ALWAYS MAINTAINED WHEN SWITCH BETWEEN COMMON VIDEO MODES AND USER DEFINED CUSTOM MODES.
- . USER FRIENDLY OSD DISPLAY FOR MODE IDENTIFICATION/ADJUSTMENT
- . DDC2B COMMUNICATION CAPABILITY
- . MAX. RESOLUTION 2048 X 1536 NON-INTERLACED AT 75 HZ
- . 21" 0.24 MM (at enter) AG PITCH COMPLETELY FLAT PICTURE TUBE
- . EASY TILT & SWIVEL BASE
- . FULL RANGE POWER SUPPLY 90 - 264 VAC
- . CE ENVIRONMENTAL POLICY
- . FLAT SQUARE TUBE TO REDUCE LIGHT REFLECTION
- . POWER MANAGEMENT CAPABILITY
- . LOW EMISSION MPR-II / TCO 99 / TCO'03
- . MOIRE' CANCELLATION
- . AUTO CALIBRATE FUNCTION
- . SRGB

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CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
2003-12-19					
NAME C.C.Liao	SUPERS.	31	590	— 1	10
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		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
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1.0 FOREWORD

This specification describes a 22" high resolution digitally controlled auto scan color monitor with max. resolution up to **2048x1536/75Hz** non-interlaced.

2.0 PRODUCT PROFILE

This display monitor unit is a complete color display monitor enclosed in **Dell** styling cabinet which has an integrated tilt and swivel base.

2.1 CRT

Type NR.	: M51LVT42X71A (MITSUBISHI NF22U3)
Dimensions	: 22"
Phosphor Pitch (mm)	: 0.24, Aperture Grille
Phosphor	: B22
Deflection angle	: 90 deg
Light transmission	: 38.4 %
Surface of plate	: Sputter coating
EHT	: 27.0 KV
Useful screen (mm)	: 406.1 x 304.6

2.2 Scanning frequencies

Horizontal: 30 - 130KHz Vertical: 50 - 160 Hz

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- 2.3 Video dot rate : 355.03MHz
- 2.4 Power input : 90 - 264 Vac, 47-63 Hz
- 2.5 Power consumption : 115W typ.
- 2.6 Dimensions : 501(W) x 501.8(H) x 465.8(D) mm
- 2.7 Weight : 29.6 kg
- 2.8 Functions:
- (1) R/G/B separate analog inputs, H/V composite sync,
 - (2) Automatic (Power on) and manual degaussing circuit.

2.9 Ambient temperature: 0 - 35 °C

2.10 Regulatory compliance:

- (1) Safety : UL 1950
: CSA C22.2 NO. 950
: IEC950/ En60950
- (2) EMI : FCC PART 15 class B
: D.O.C. Class B
: EN55022 Class B
: CE mark
: CNS 13438
EMS : EN61000-4-3(80% 1KHz AM modulation) picture jitter < 2mm
- (3) X-RAY Radiation requirement / regulation
: DHHS 21 CFR Subchapter J.
: ROEV / 08.01.1987
- (4) Low Radiation
: MPR-II / TCO99 / TCO'03
- (5) Environmental
: Per CE and BU policy
- (6) Ergonomic Requirements
: ZH 1/618
: EN 9241-3 / ISO 9241-3 (7/92) / ISO 9241-8
- (7) Harmonic distortion regulation: Meet IEC 1000-3-2

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		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
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3.0 Electrical characteristics

3.1 Interface signals

The input signals can be applied in three different modes:

- 1). Video, H-sync & V-sync
- 2). Video & Composite Sync
- 3). Video with Sync On Green (composite Green video).

Video : 0.7 Vp-p, input impedance, 75 ohm

Sync. :	Separate sync	TTL level, input impedance 2k2 ohm
	Hor. sync	Positive/Negative
	Ver. sync	Positive/Negative

	Composite sync	TTL level, input impedance 2k2 ohm
		Positive/Negative

Sync On Green Part. Composite Green video, 0.3 Vp-p for sync

3.2 Interface

3.2.1 Cable

The input signals are applied to the display through a detachable shielded cable.

Length : 1.8 m +/- 50 mm (detachable)

Connector type : 15 pin D-Sub male to 15 pin D-Sub male, blue IBM PS/2 standard (3 rows) with DDC2B pin assignments

3.2.2 Input connectors

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
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- 15 pin D-sub1 & D-sub 2 connectors (rear)

pin assignments :

pin no.	
1	Red video input
2	Green video input (Green video with Sync On Green input)
3	Blue video input
4	Ground
5	Ground
6	Red video ground
7	Green video ground
8	Blue video ground
9	+5V
10	Sync Ground
11	Ground
12	Bi-directional data (SDA)
13	H/H+V sync
14	V sync (VCLK)
15	Data clock (SCL)

3.2.3 Adaptor 15 pin D-standard (2 rows male) to 15 pin D-sub (female) for Apple MacIntosh II use (optional).

pin assignments :

pin no	15 Pin D-standard
1	RED GND
2	RED VIDEO
3	COMPOSITE SYNC
4	SYNC GND
5	GREEN VIDEO (Green video with Sync On Green input)
6	GREEN GND
7	NC
8	NC
9	BLUE VIDEO
10	NC
11	NC
12	NC
13	BLUE GND
14	NC
15	NC

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
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3.2.4 Software control functions via OSD/control

- Adjustable functions:

P1230 Main Controls

Language
Input signal selection
Zoom
Adjust horizontal
Adjust vertical
Adjust shape
Adjust color
Reset to factory settings
Extra Controls

Close Main Controls
Move selection then ☐ok☐
Running at resolution@ vertical freq

Language

-Language: multi-language (at least 5 languages)

Input

-Input signal selection

Zoom

- Zoom

Adjust horizontal

-Adjust position
-Adjust size

Adjust vertical

-Adjust position
-Adjust size

Adjust shape

-Adjust side curve
Pincushion
Balanced
-Adjust side angles
Trapezoid
Parallelogram
-Rotate image
Rotate

CLASS NO.

22" CMTR-M25P-Dell-P1230

TYPE : 6L3P10/76

OEM : Dell P1230 130KHz

8639 000 15121

2003-12-19

NAME C.C.Liao

SUPERS.

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Adjust color

- 9300K for general use
- 6500K for image management
- 5500K for photoretouch
- sRGB
- User preset

Reset to factory settings

- No
- Yes

Extra Controls

- Adjust moire
Horizontal
- Degauss
- Adjust convergence
Horizontal
Vertical
- Adjust purity
Top left
Top right
Bottom left
Bottom right

Serial No.

3.3 Timing requirement

3.3.1 Mode storing capacity

Total factory modes	: 32
Preset modes	: 9
Preload modes	: 23
User modes	: 16

The 9 preset modes are listed in 4.2 / page17.

3.3.2 Factory modes include preset, pre-load timings

The 32 factory modes detailed timings are according to the tables as below, the timing charts refer to FIG-8 & FIG-9.

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
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MODE NO.	1	2	3	4
RESOLUTION	720 x 400	640 x 480	640 x 480	640 x 480
Dot clock(MHz)	28.321	25.175	31.500	36.000
f h	31.468 kHz	31.469 kHz	37.500 KHz	43.269 kHz
A (us)	31.778	31.778	26.667	23.111
B (us)	3.813	3.813	2.032	1.556
C (us)	1.907	1.907	3.810	2.222
D (us)	25.422	25.422	20.317	17.778
E (us)	0.636	0.636	0.508	1.556
f v	70.085 Hz	59.941 Hz	75.000 Hz	85.008 Hz
O (ms)	14.268	16.683	13.333	11.764
P (ms)	0.064	0.064	0.080	0.069
Q (ms)	1.080	1.048	0.427	0.578
R (ms)	12.711	15.253	12.800	11.093
S (ms)	0.413	0.318	0.027	0.023
SYNC. H/V	- / +	- / -	- / -	- / -
POLARITY				
SEP . SYNC	Y	Y	Y	Y

MODE NO.	5	6	7	8
RESOLUTION	800 x 600	800 x 600	1024 x 768	1024 x 768
Dot clock(MHz)	49.500	56.250	65.000	78.750
f h	46.875 kHz	53.674 kHz	48.363 kHz	60.023 kHz
A (us)	21.333	18.631	20.677	16.660
B (us)	1.616	1.138	2.092	1.219
C (us)	3.232	2.702	2.462	2.235
D (us)	16.162	14.222	15.754	13.003
E (us)	0.323	0.569	0.369	0.203
f v	75.000 Hz	85.061 Hz	60.004 Hz	75.029 Hz
O (ms)	13.333	11.756	16.666	13.328
P (ms)	0.064	0.056	0.124	0.050
Q (ms)	0.448	0.503	0.600	0.466
R (ms)	12.800	11.179	15.880	12.795
S (ms)	0.021	0.018	0.062	0.017
SYNC. H/V	+ / +	+ / +	- / -	+ / +
POLARITY				
SEP . SYNC	Y	Y	Y	Y

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
2003-12-19		31		590 — 10 10 A4	
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MODE NO.	9	10	11	12
RESOLUTION	1024 x 768	1152 x 864	1152 x 864	1280 x 1024
Dot clock(MHz)	94.500	108.000	119.651	108.000
f h	68.677 kHz	67.5 kHz	77.095kHz	63.981 kHz
A (us)	14.561	14.815	12.971	15.630
B (us)	1.016	1.185	1.070	1.037
C (us)	2.201	2.37	1.672	2.296
D (us)	10.836	10.667	9.628	11.852
E (us)	0.508	0.593	0.602	0.445
f v	84.997 Hz	75 Hz	85Hz	60.020 Hz
O (ms)	11.765	13.333	11.765	16.661
P (ms)	0.044	0.044	0.039	0.047
Q (ms)	0.524	0.474	0.506	0.594
R (ms)	11.183	12.815	11.207	16.005
S (ms)	0.015	0.015	0.0123	0.015
SYNC. H/V	+ / +	+ / +	- / +	+ / +
POLARITY				
SEP . SYNC	Y	Y	Y	Y

MODE NO.	13	14	15	16
RESOLUTION	1280 x1024	1280 x 1024	1400 x 1050	1400 x 1050
Dot clock(MHz)	135.00	157.500	122.614	155.851
f h	79.976 kHz	91.146 kHz	65.220 kHz	82.200 kHz
A (us)	12.504	10.971	15.333	12.165
B (us)	1.067	1.016	1.240	0.975
C (us)	1.837	1.422	1.957	1.591
D (us)	9.481	8.127	11.418	8.983
E (us)	0.119	0.406	0.718	0.616
f v	75.025 Hz	85.024 Hz	60.000 Hz	75.000 Hz
O (ms)	13.329	11.761	16.667	13.333
P (ms)	0.038	0.033	0.046	0.037
Q (ms)	0.475	0.483	0.506	0.511
R (ms)	12.804	11.235	16.099	12.774
S (ms)	0.013	0.011	0.015	0.012
SYNC. H/V	+ / +	+ / +	- / +	- / +
POLARITY				
SEP . SYNC	Y	Y	Y	Y

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
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MODE NO.	17	18	19	20
RESOLUTION	1400 x 1050	1600 x 1200	1600 x 1200	1600 x 1200
Dot clock(MHz)	179.260	162	202.500	229.500
f h	93.755 kHz	75.000 kHz	93.750 kHz	106.250 kHz
A (us)	10.666	13.333	10.667	9.412
B (us)	0.848	1.185	0.948	0.837
C (us)	1.428	1.877	1.501	1.325
D (us)	7.810	9.877	7.901	6.972
E (us)	0.580	0.395	0.316	0.279
f v	85.000 Hz	60.000 Hz	75.000 Hz	85.000 Hz
O (ms)	11.765	16.667	13.333	11.765
P (ms)	0.032	0.040	0.032	0.028
Q (ms)	0.523	0.613	0.491	0.433
R (ms)	11.199	16.000	12.800	11.294
S (ms)	0.011	0.013	0.011	0.009
SYNC. H/V	- / +	+ / +	+ / +	+ / +
POLARITY				
SEP . SYNC	Y	Y	Y	Y

MODE NO.	21	22	23	24
RESOLUTION	1280 x800	1280 x800	1280 x800	1600 x 1000
Dot clock(MHz)	107.214	123.379	147.891	169.128
f h	62.625 kHz	71.400 kHz	84.800 kHz	78.300 kHz
A (us)	15.968	14.006	11.792	12.771
B (us)	1.268	1.102	0.92	1.041
C (us)	2.015	1.816	1.569	1.656
D (us)	11.939	10.375	8.655	9.460
E (us)	0.746	0.713	0.649	0.615
f v	75.000Hz	85.000Hz	100.000Hz	75.000 Hz
O (ms)	13.333	11.765	10.000	13.333
P (ms)	0.048	0.042	0.0354	0.038
Q (ms)	0.495	0.504	0.519	0.511
R (ms)	12.774	11.204	9.434	12.771
S (ms)	0.016	0.014	0.012	0.013
SYNC. H/V	- / +	- / +	- / +	- / +
POLARITY				
SEP . SYNC	Y	Y	Y	Y

CLASS NO.

22" CMTR-M25P-Dell-P1230

TYPE : 6L3P10/76

OEM : Dell P1230 130KHz

8639 000 15121

2003-12-19

NAME C.C.Liao

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MODE NO.	25	26	27	28
RESOLUTION	1600 x 1000	1792 x 1344	1920 x 1440	1856 x 1392
Dot clock(MHz)	194.208	204.750	297.594	218.250
f h	89.250 kHz	83.640 kHz	112.725kHz	86.333 kHz
A (us)	11.204	11.956	8.871	11.583
B (us)	0.906	0.977	0.699	1.026
C (us)	1.483	1.602	1.210	1.613
D (us)	8.239	8.752	6.452	8.504
E (us)	0.577	0.625	0.511	0.440
f v	85.000 Hz	60.000 Hz	75.000 Hz	59.995 Hz
O (ms)	11.765	16.667	13.333	16.668
P (ms)	0.034	0.036	0.0266	0.035
Q (ms)	0.515	0.550	0.5234	0.498
R (ms)	11.204	16.069	12.774	16.124
S (ms)	0.011	0.012	0.0089	0.012
SYNC. H/V	- / +	- / +	- / +	- / +
POLARITY				
SEP. SYNC	Y	Y	Y	Y

MODE NO.	29	30	31	32
RESOLUTION	1920 x 1200	1920 x 1440	1920 x 1440	2048 x 1536
Dot clock(MHz)	246.590	234.000	320.207	CVT 339.000
f h	93.975 kHz	90.000 kHz	120.560 kHz	120.384 kHz
A (us)	10.641	11.111	8.295	8.307
B (us)	0.844	0.889	0.675	0.661
C (us)	1.427	1.470	1.149	1.133
D (us)	7.786	8.205	5.996	6.041
E (us)	0.584	0.547	0.475	0.472
f v	75.000 Hz	60.000 Hz	80.000 Hz	74.959 Hz
O (ms)	13.333	16.667	12.500	13.341
P (ms)	0.032	0.033	0.025	0.033
Q (ms)	0.521	0.622	0.523	0.523
R (ms)	12.769	16.000	11.944	12.759
S (ms)	0.011	0.011	0.008	0.025
SYNC. H/V	- / +	- / +	+ / +	- / +
POLARITY				
SEP. SYNC	Y	Y	Y	Y

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
2003-12-19					
NAME	C.C.Liao	SUPERS.	31	590	13
TY	CHECK	DATE	2003-12-19	10	A4

2838 100 05424

◀◀ Go to cover page

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3.3.3 Horizontal scanning

Sync polarity : Positive or Negative
Scanning frequency : 30 - 130 KHz
Retrace time : 1.6 sec (typical)

3.3.4 Vertical scanning

Sync polarity : Positive or Negative
Scanning frequency : 50 - 160 Hz

3.4 Power input connection

Power cord length : 1.8 M
Power cord type : 3 leads detachable power cord with Protective earth plug.

3.5 Video amplifiers

Rise time/Fall time : 4.0 / 4.0 ns
(Excluding rise/fall time due to test pattern & test probe)
Overshoot/undershoot : Max. 28%
Black level shift : Max. 3%
Sag : Max. 5%

3.6 Degaussing

An automatic degaussing circuit is provided and required no intervention
The degaussing is activated at the time of switch-on and power saving wake up or switch-on again after switched-off for longer than 30 minutes.
Manual degaussing is provided to eliminate any color impurity.

3.7 Requirement for low emission

(1) Electro static potential : < +/- 0.5 KV
(2) Alternating Elec. field
ELF 5 - 2 KHz : ≤ 10.0 V/M
VLF 2 - 400 KHz : ≤ 1.0 V/M
(3) Magnetic field
ELF 5 - 2 KHz : ≤ 200 nT
VLF 2 - 400 KHz : ≤ 25 nT

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
2003-12-19					
NAME C.C.Liao	SUPERS.	31	590	14	10
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3.8 Power management

The power consumption and the status indication of the set with power management function are as follows,

<u>STATUS</u>	<u>Horizontal</u>	<u>Vertical</u>	<u>Power Spec</u>	<u>LED</u>
On	Pulse	Pulse	as normal on	Green
OFF	No Pulse	Pulse	< 1 W	Amber
OFF	Pulse	No Pulse	< 1 W	Amber
OFF	No Pulse	No Pulse	< 1 W	Amber

Entering from ON state to Power saving state has 5 - 10 second time delay. It awake from OFF state to On state within 3 seconds.

Compliant with **MPR-II / TCO99 / TCO'03** power saving requirement
EPA energy star requirement
E2000

3.9 Display identification

In accordance with VESA Display Channel Standard and having DDC 2B capability

4.0 Visual characteristics

4.1 Test conditions

Unless otherwise specified, this specification is defined under the following conditions.

- (1) Input signal: As defined in 3.1
- (2) Luminance setting: controls to be set to 20 ft-lb with full screen 100 % duty cycle white signal.
- (3) Warm up: more than 30 minutes after power on with signal supplied.
- (4) Ambient light: 400 -- 600 lux.
- (5) Ambient temperature: 23 °C
- (6) Ambient magnetic field: no special ambient magnetic field existed.
(the ac leakage flux, dc flux caused by transformer magnet, etc.)
- (7) CRT face: East

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
2003-12-19					
NAME C.C.Liao	SUPERS.	31	590	15	10 A4
TY	CHECK	DATE 2003-12-19	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.		



4.2 Resolution

Mode	Resolution	H. freq. / V. freq	Standard
1.	640 x 480	31.469kHz/59.94Hz	(VESA/60)
2.	640 x 480	43.269kHz/85.080Hz	(VESA/85)
3.	800 x 600	53.674kHz/85.061Hz	(VESA/85)
4.	1024 x 768	60.023kHz/75.029Hz	(VESA/75)
5.	1024 x 768	68.677kHz/84.997Hz	(VESA/85)
6.	1280 x 1024	79.976kHz/75.024Hz	(VESA/75)
7.	1280 x 1024	91.15kHz/85.000Hz	(VESA/85)
8.	1600 x 1200	93.75kHz/75.000Hz	(VESA/75)
9.	1600 x 1200	106.25kHz/85.000Hz	(VESA/85)

4.3 Brightness

Color Temp	Brightness control	Contrast control	White Square (see fig-5)	Full white
	CENTER	MIN		<0.1 FL
@9300°K	CENTER	MAX	34 +4-2 FL	31 +3 / -2 FL
@6500°K	CENTER	MAX	30 +4-2 FL	
@5500°K	CENTER	MAX	27 +4-2 FL	

4.3.1 sRGB

Once press "sRGB" function on OSD, the luminance shall be changed to **24 +5/-3 ft-lb** and color temperature is matching to 6500° K, at white square pattern.

4.4 Flag waving jitter less than 0.15mm.

4.5 Image size

4.5.1 Actual display size

The dimensions of the data area, measured along the picture center of horizontal and vertical axis of the screen, are listed below: (see FIG-1) (392+/-4 mm) X (294+/-4 mm)

4.5.2 Max scan size

Maximum active video size should be not smaller than mask opening. The mask opening is 406.1 x 304.6 mm.

4.6 Image centering deviation

| A-B | and | C-D | ≤ **4 mm**, please see FIG-2

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
2003-12-19					
NAME C.C.Liao	SUPERS.	31	590	16	10
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- 4.7 Picture shift range
H-shift range : total 20 mm.
V-shift range : total 15 mm.
- 4.8 Display dimension stability
Due to brightness : 1.0 %
Due to aging : 1.0 %
Due to mains voltage : 1.0 %
Dynamic : $\leq 0.5\text{mm}$
- 4.9 Geometric distortions
Pincushion, trapezoid, parallelogram, rotation and other various distortions must remain within the limits to tolerance as in FIG-4.

Top or bottom : $< 1.5\text{mm}$
Top + bottom : $< 3.0\text{mm}$
Left or right : $< 2.0\text{mm}$
Left + right : $< 3.5\text{mm}$
Tilt : $\leq 1\text{mm}$ ($\leq 0.5^\circ$)
Short segments : $\leq 0.5\text{mm}$ (Line straightness 50mm)
Long segments : No greater than 1% of line segment length.
(For all preload modes, the entire image should be displayed Inside the bezel.)

- 4.10 Picture tilt
 $\pm 1\text{mm}$ (see FIG-3)
User adjust range for tilt: 0.5°
- 4.11 Image non-linearity (12 x 9 grid)

Max. - Min.

----- x 100 %

Mean

Horizontal & vertical non-linearity (B) $\leq 10\%$ (all other preset modes 30 - 130 kHz)

$\leq 8\%$ (Prime mode

93.75 kHz)

For any two adjacent horizontal & vertical blocks: (B)

$\leq 8\%$ (all other preset modes 30 - 130 kHz)

$\leq 5\%$ (Prime mode 93.75 kHz)

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
2003-12-19					
NAME C.C.Liao	SUPERS.	31	590	17	10
TY	CHECK	DATE 2003-12-19	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.		



4.12 Mis-convergence

The maximum convergence error should be measured on a white line and represents the maximum distance between the center of the red, green and blue lines over the whole image area.

Max. Mis-convergence:

(Picture area 392mm X 294mm See FIG-6)

Zone	From 31.5Khz to 64Khz	From 64Khz to 130Khz (without 94Khz)	94Khz
B	≤ 0.45	≤ 0.40	≤ 0.35
A	≤ 0.35	≤ 0.30	≤ 0.25
C	N/A	N/A	N/A

4.13 Focus check

First, adjust brightness to 50 % position and contrast to 100% position, and then generate "ME" characters for 1280 X 1024 / 85Hz or 1600 x 1200 / 85Hz timings to cover entire picture area (picture size is shown in sect. 4.5). Characters should be clearly identified at the center and all corners. Character size is shown in FIG-7.

4.14 Brightness uniformity

With an active full area white video input pattern and contrast setting to 100%, no portion of the pattern shall be less than 75 % of the luminance measured at the CRT center.

4.15 White color adjustment

There are three factory preset white color 9300° K, 6500° K and 5500° K.

Apply full white pattern, with brightness in 50 % position and the contrast control at max. position.

The 1931 CIE Chromaticity (color triangle) diagram (x, y) coordinate for the screen center should be:

9300° K CIE coordinates X = 0.283 +/- 0.020
Y = 0.297 +/- 0.020

6500° K CIE coordinates X = 0.313 +/- 0.020
Y = 0.329 +/- 0.020

5500° K CIE coordinates X = 0.332 +/- 0.020
Y = 0.347 +/- 0.020

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
2003-12-19					
NAME C.C.Liao	SUPERS.	31	590	18	10
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4.16 White uniformity

Set the brightness control at center 50 % position, then adjust the contrast, control to set the luminance at the center of the screen to 100% max..

The color coordinate at any point on the screen should be:

$$X = X(\text{center}) \pm 0.015$$

$$Y = Y(\text{center}) \pm 0.015$$

4.17 Color tracking on full white pattern

Adjust the contrast control from max. to min. (with brightness at click position). The color coordinates should not deviate more than:

$$x = x(\text{center}) \pm 0.015$$

$$y = y(\text{center}) \pm 0.015$$

4.18 Purity

Conditions: With full color pattern, with brightness control at 50 % position and contrast control in maximum, under the specific destinations of earth magnetic environments.

After a warm-up time of 30 min., the purity control can be used to Eliminate, colored stains if it occurs, the monitor should be well degaussed before purity adjustment.

Remark: If the external degaussing is used, the degaussing coil should be a stick type, Can't use ring type for MITSUBISHI NF CRT.

To set the electrical current of four corners purity coils and N/S coil (if exists) equal to zero, or switch off the monitor before external degaussing.

4.19 Moire

At 15FL contrast & moire is acceptable if not over 1/3 area.

4.20 Ringing

Apply a full white pattern at 120.5kHz, set horizontal raster symmetrically by raster shift press the OSD button & select "horizontal position" shift the image to the left edge of the raster. The yoke ring should less than 20mm.

4.21 Tapping test

No interference does disturb the monitor picture during tapping test with a rubber hammer.

4.22 Distance between two monitors

Two monitors of the same monitor type which were conducted with Different Modes or frequencies, don't show any interference in a distancedown to 25cm.

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
2003-12-19					
NAME	C.C.Liao	SUPERS.	31	590 — 19	10 A4
TY	CHECK	DATE	2003-12-19	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.	



5.0 Mechanical characteristics

5.1 Controls

Front side :

- AC power switch
- OSD function key

Rear :

- D-sub 1 / D-sub 2
- Power cord socket

5.2 Unit dimension / Weight

Unit dimensions (including pedestal): 501(w) x 503 (h) x 471(d) mm

Unit Net weight: 30 kg

5.3 Tilt and swivel base

The display is equipped with a detachable tilt and swivel device allowing rotation over an angle of 90 degrees left or right, and for a tilt of 5 to +15 degrees w.r.t. the horizontal position.

5.4 Transportation packages

A) Carton box : 656(w) x 667(d) x 673(h)mm.

B) Container loading (Pedestal mounted to monitor)

Quantity	Container size 40
Layers	3
Sets per layer	2
Sets per block	6
Blocks per container	27
Total sets	162

6.0 Environmental characteristics

The following sections define the interference and susceptibility condition limits that might occur between external environment and the display Device.

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
2003-12-19					
NAME C.C.Liao	SUPERS.	31	590	— 20	10 A4
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6.1 Susceptibility of display to external environment

Operating

- Temperature : 0 to 35 ° C (Guaranteed optical performance)
- Relative Humidity : 20 to 80 % (non-condensing)
- Altitude : 10,000ft

Storage

- Temperature C : -20 to 60°
- Relative Humidity : 5% to 95% (non-condensing)
- Altitude : 10,000ft

Shipping

- Temperature C : -40 to 65°
- Relative Humidity : 5% to 95% (non-condensing)
- Altitude : 15,000ft

6.2 Transportation tests

TEST ITEM	TEST LEVEL
Random Vibration test	Truck spectrum, with 1.15Grms, 30 min. per axis, 6 surfaces Frequency (Hz): 1,4,100,200 G ² /Hz: 0.0001, 0.01, 0.01, 0.001
Room temperature Drop Test	6F, 1C, 3E total 10 drops Height (cm): 46

6.3 Display disturbances from external environment
According to IEC 801-2 for ESD disturbances

6.4 Display disturbances to external environment

6.4.1 Ionizatic radiation

Completely fulfilled International Commission of
Radiological Protection (ICRP) requirement 0.5 mR/hrs.

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CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
2003-12-19					
NAME C.C.Liao	SUPERS.	31	590	21	10
TY	CHECK	DATE 2003-12-19	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.		



7.0 Reliability

7.1 Mean Time Between Failures

MTBF to be calculated according to military standard MIL-HDBK-217C.

MTBF (Excluding the CRT) > 60,000 hrs @ 70% CL before FCS

MTBF (Excluding the CRT) > 120,000 hrs @ 90% CL after FCS

$$\text{Practice of MTBF} = \frac{\text{Total hrs (power on)} \times \text{Total sets}}{\text{NO. of failed sets}}$$

8.0 Quality assurance requirements

8.1 Acceptance test

according to MIL-STD-105D Control II level

AQL : 0.65 (major)

2.50 (minor)

(please also refer to annual quality agreement)

Customer acceptance criteria : UAW0377/00

9.0 Serviceability

The serviceability of this monitor should fulfill the requirements which are prescribed in UAW-0346 and must Be checked with the check list UAT-0361.

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
2003-12-19					
NAME	C.C.Liao	SUPERS.	31	590	— 22
TY		CHECK	DATE 2003-12-19	10	A4
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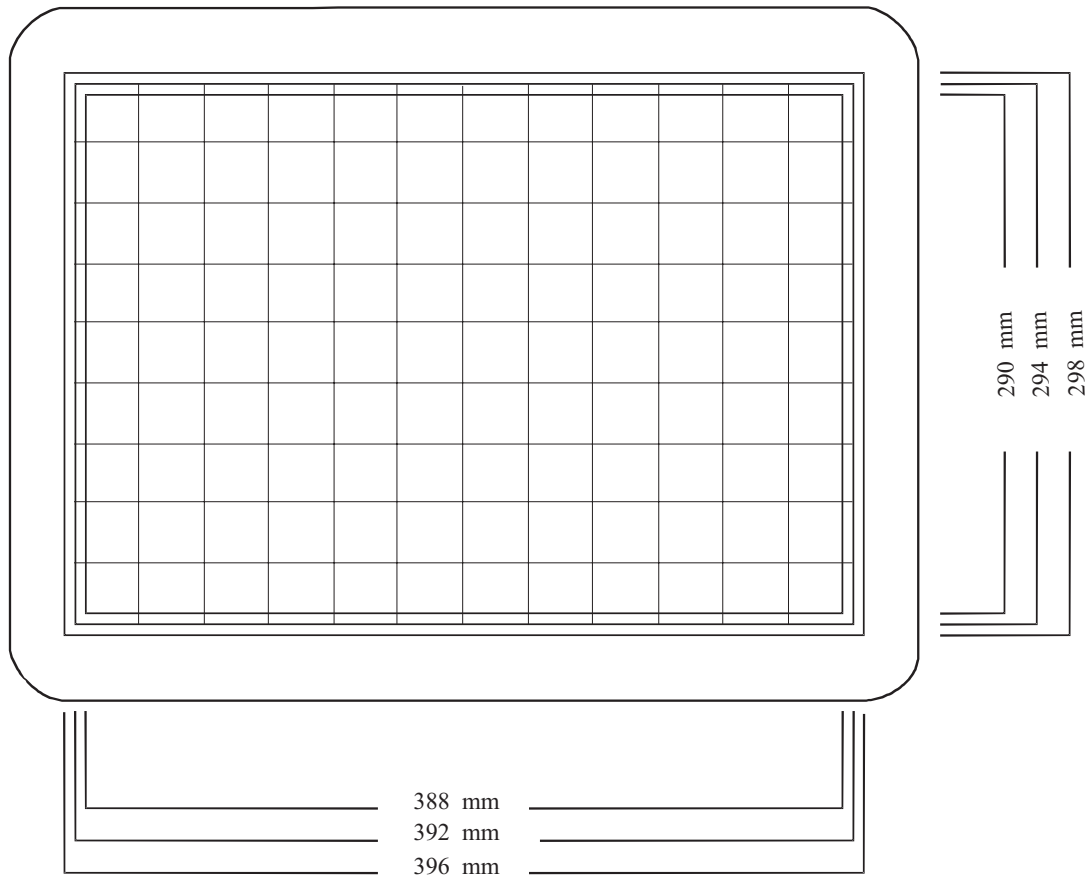


FIG-1 IMAGE DEMENSION

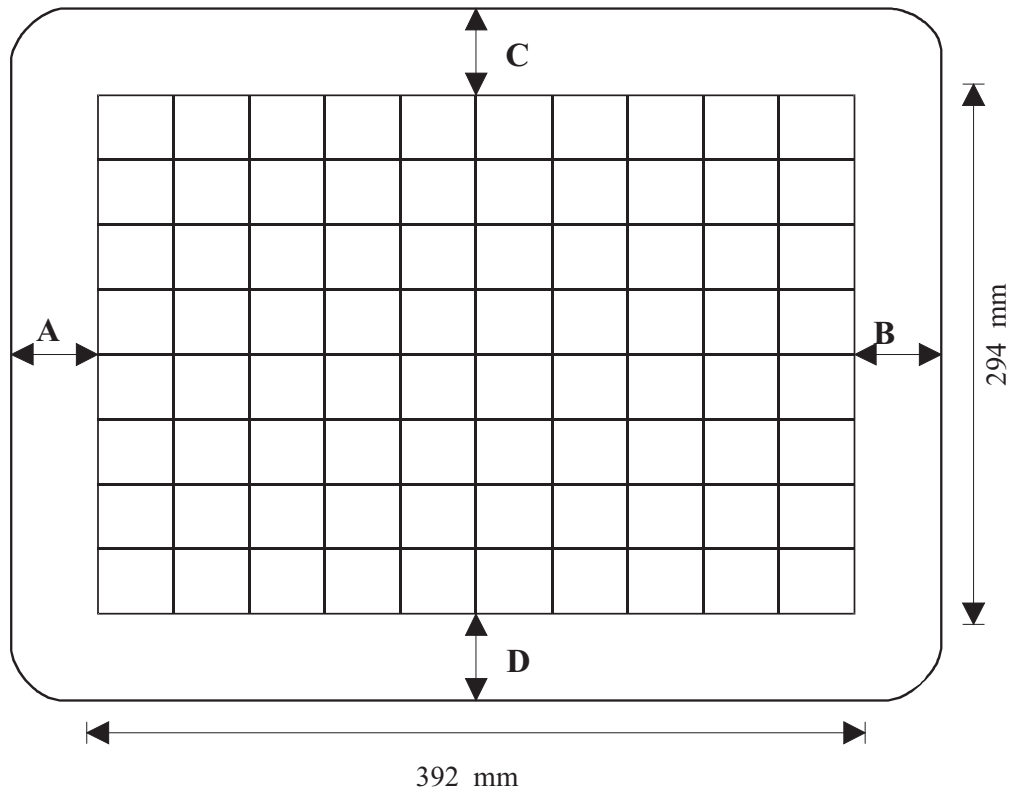
CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
2003-12-19		TYPE : 6L3P10/76 OEM : Dell 130KHz			
NAME C.C.Liao	SUPERS.	31	590	23	10
TY	CHECK	DATE 2003-12-19	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.		

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$$|A-B| \text{ AND } |C-D| < 4 \text{ mm}$$

FIG-2 IMAGE CENTERING

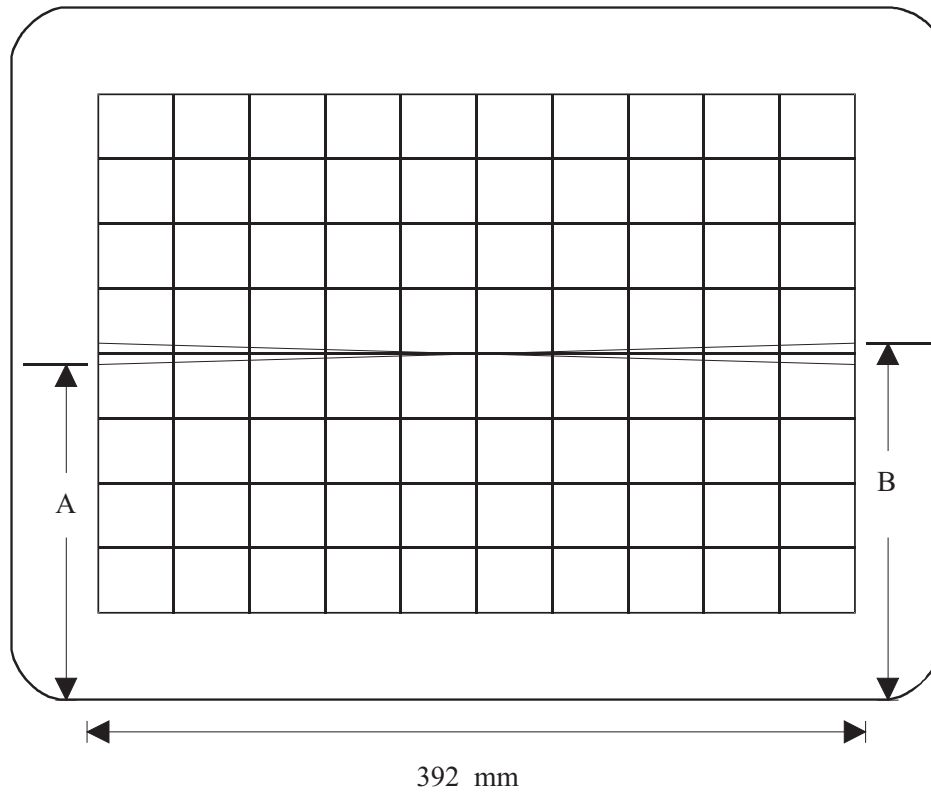
CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
2003-12-19					
NAME	C.C.Liao	SUPERS.	31	590 — 24	10 A4
TY	CHECK	DATE	2003-12-19	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.	

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$$|A-B| < 2 \text{ mm}$$

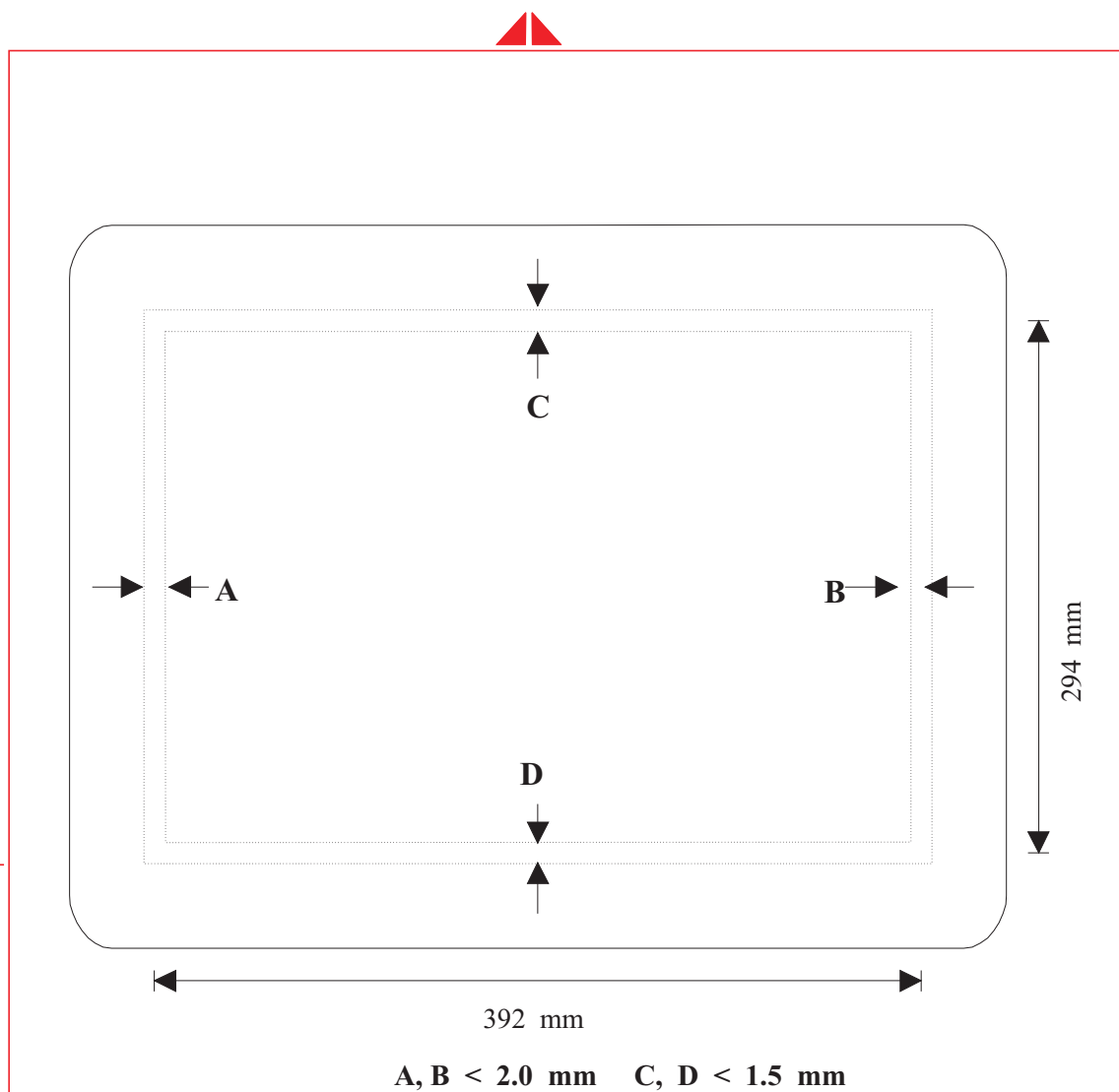
FIG-3 IMAGE ROTATION

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
2003-12-19		TYPE : 6L3P10/76 OEM : Dell 130KHz			
NAME C.C.Liao	SUPERS.	31	590	25	10
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**FIG-4 IMAGE GEOMETRY**

CLASS NO.		22" CMTR-M25P-Dell-P1230			
		TYPE : 6L3P10/76		8639 000 15121	
		OEM : Dell P1230 130KHz			
2003-12-19		31		590 — 26	
NAME C.C.Liao		SUPERS.		10	
TY		CHECK		A4	
DATE 2003-12-19		Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.			

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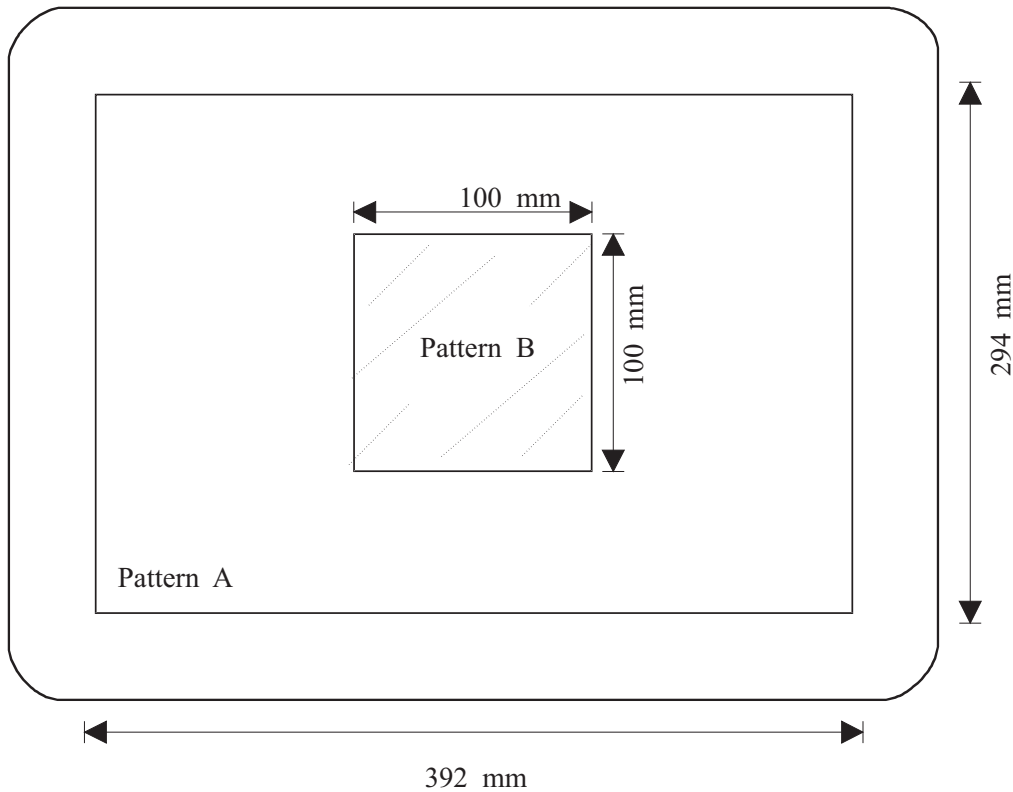
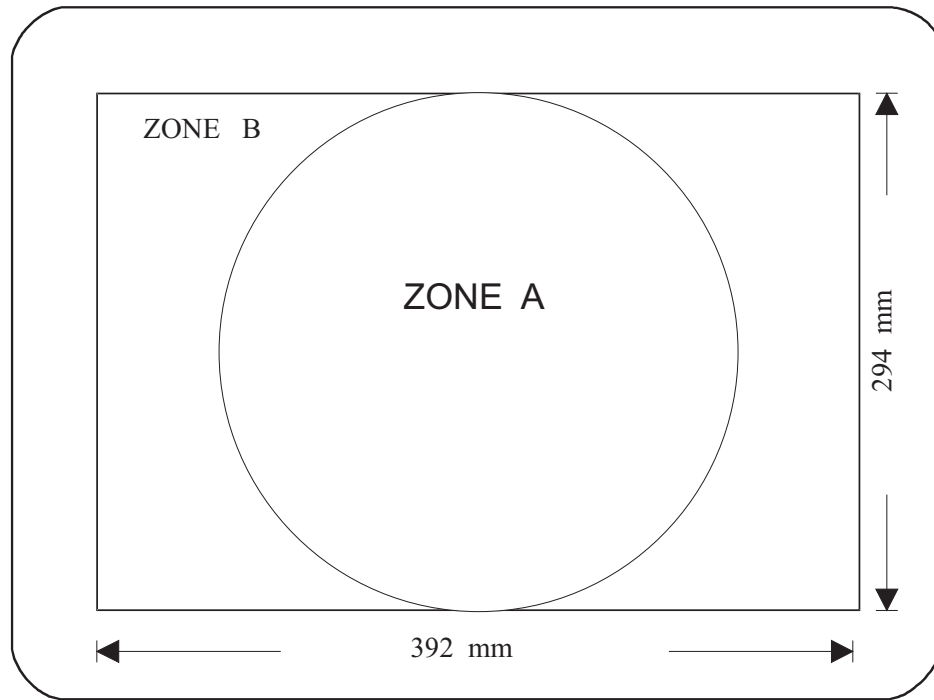


FIG-5 CONTRAST AND BRIGHTNESS MEASUREMENT PATTERNS

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
2003-12-19		31		590 — 27	
NAME C.C.Liao		SUPERS.		10	
TY		CHECK		A4	
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**FIG-6 MISCONVERGENCE
MEASUREMENT AREA**

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
2003-12-19					
NAME	C.C.Liao	SUPERS.	31	590	— 28
TY		CHECK	DATE 2003-12-19	10	A4
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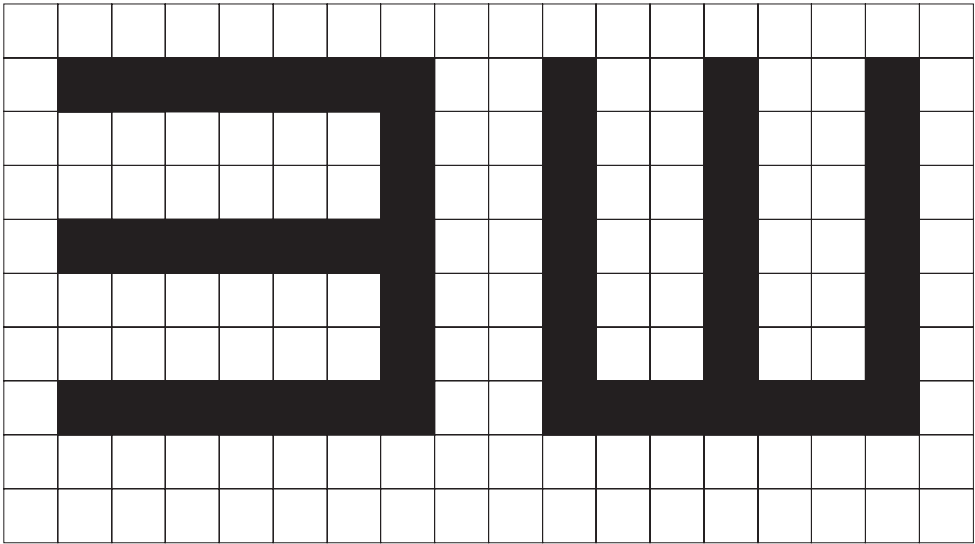


FIG 6 SYMBOL FORMAT FOR FOCOS CHECK

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
2003-12-19		31		590 — 29	
NAME C.C.Liao		SUPERS.		10	
TY		CHECK		A4	
DATE 2003-12-19		Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.			

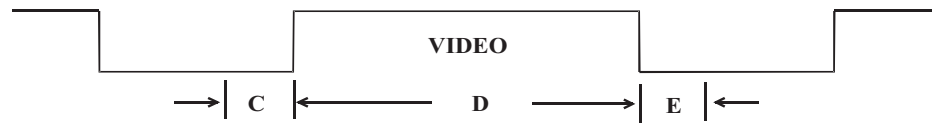
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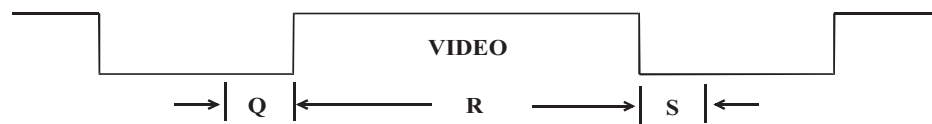


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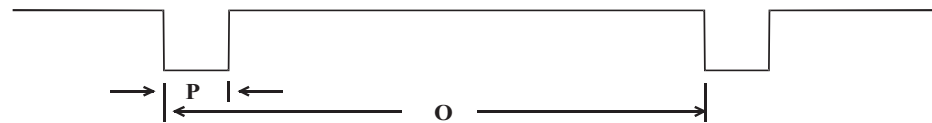
SEPARATE SYNC.



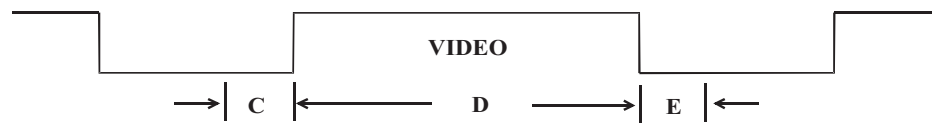
HORIZONTAL



VERTICAL



COMPOSITE SYNC.



HORIZONTAL

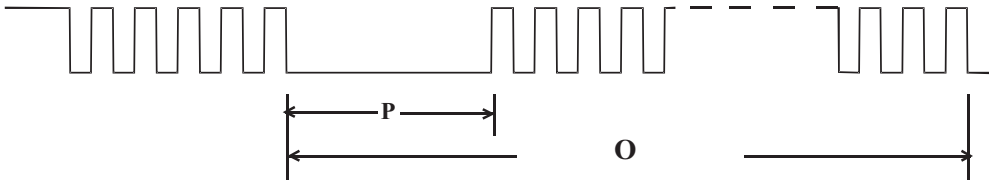
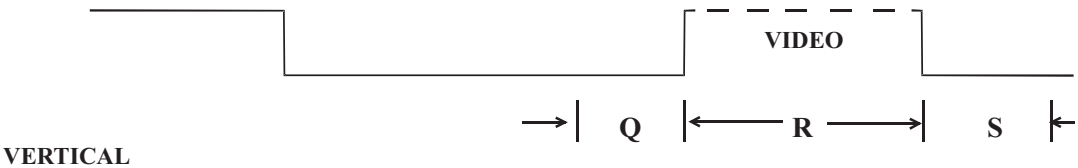


FIG-8 TIMING CHART -1

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
		TYPE : 6L3P10/76			
		OEM : Dell P1230 130KHz			
2003-12-19					
NAME	C.C.Liao	SUPERS.	31	590 — 30	10 A4
TY	CHECK	DATE	2003-12-19	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.	

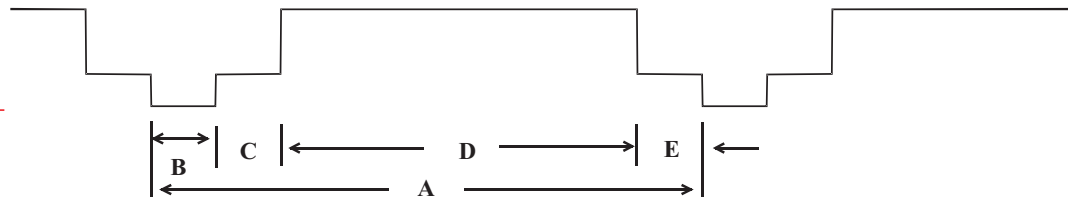
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COMPOSITE SYNC. & VIDEO
(SYNC. ON GREEN)

HORIZONTAL



VERTICAL

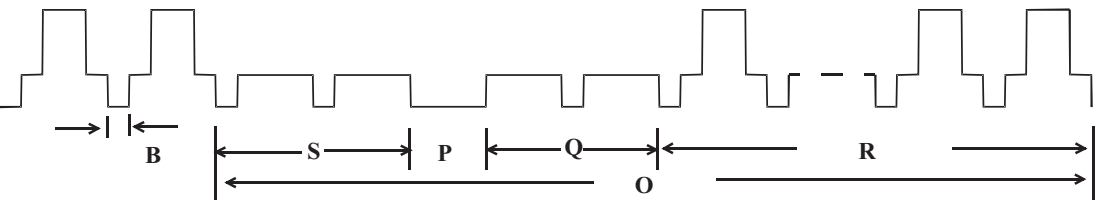


FIG-9 TIMING CHART -2

CLASS NO.		22" CMTR-M25P-Dell-P1230		8639 000 15121	
2003-12-19		TYPE : 6L3P10/76			
		OEM : Dell 130KHz			
NAME	C.C.Liao	SUPERS.	31	590	31
TY	CHECK	DATE	2003-12-19	Property of	PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.

1. GENERAL DESCRIPTION

The P1230 using 22" flat AG CRT is real" Digital Controlled Auto-scan Color Display Monitor" with high resolution which can operate horizontal scan frequency from 30KHz up to 130KHz, and vertical scan frequency from 50 to 160 Hz.

P1230 is equipped with an embedded micro-controller to provide required preset modes and well adjusted by factory then stored the data into EEPROM, it also provides many functions, such as digitally adjustable picture, power management, sRGB, low emission, high immunity, DDC2B ---- etc.

This monitor complies with TCO99/TCO03 low emission standard, E2000 automatic power saving requirements, to reduce power consumption less than 2 watts in power saving mode, also fulfill VESA standard and energy star computer program of the EPA.

2. DESCRIPTION OF CIRCUIT DIAGRAM

This description briefly introduces the functions including power supply, power saving management, horizontal / vertical deflection, video amplifier, micro-controller and purity and convergence control, etc.

A. POWER SUPPLY / POWER SAVING MANAGEMENT

The monitor is designed to adopt switching mode power supply which can operate mains input from 90VAC to 264VAC, this switching power supply applies an IC (STR-F6656 or STR-F6456) for QUASI-RESONANT MODE controller, that power MOSFET is packed inside as well. The control scheme transforms a switching converter from a voltage source into a multi-output voltage, the control concept is exhibited many desirable properties such as inherent over-load protection, stable and fast system response, the maximum power delivery is up to 180 watts, then to be limited by limiting circuit for safety reason, secondary feedback via a photo-coupler is used to obtain a stable output voltage, the multi-outputs supply all necessary voltages to deflection, video and rest except micro-controller.

In order to meet new requirement of E2000 - power consumption less 2 watts @ off mode, an extra second power supply is adopted, this 2nd power applies SOPS technology, not only supply the +5V to micro-controller, it is also used to start up the main power supply mentioned above, such design concept can reduce power dissipation in power start up circuit, in order to deliver enough power in normal "ON" operation, the 2nd power must work at high frequency mode, and to be switched into burst mode via micro-controller for less 2 watts requirement @ off mode, this design has been considered and executed at low and high mains voltage.

All rectified diodes on secondary site are without lead frame (heat-sink), it gains some cost saving in thermal design, but the turn ratios of main transformer should be fixed to maintain an adequate voltage derating of primary switching MOSFET and secondary +230V rectified diode 31DF6 (with better thermal performance), this is trade off design in between, the other hand, a primary DC power switch which can replace AC power switch is also reserved but symbol on the bezel must be modified for the approbation reason.

This monitor will enter power saving "OFF" mode while no sync signal input and automatically recover to normal power "ON" when sync signals are detected by micro-controller.

During "Off" mode operation, all the output voltages of main power are reduced to zero, only the required voltage of micro-controller is supplied by second power supply, it is also used to restart the main power while monitor wake-up from "OFF" to "ON"

A. HORIZONTAL DEFLECTION / VERTICAL DEFLECTION / EHT GENERATOR

HORIZONTAL DEFLECTION:

The heart of horizontal/vertical deflection is TDA4856 -- deflection controller, which can offer a complete and efficient small signal sync processing for auto-sync monitors, all functions are controlled via I2C bus. This controller -- TDA4856 handles sync processing to accept separate and composite (H+V) input signals, it also provides extensive functions like a flexible B+ controller block of H-deflection and a geometry control with facilities, leading to excellent picture quality, this device also can directly drive the vertical deflection output stage, line driver stage, E/W output stage and all controls are tracked with the incoming frequencies, picture can be adjusted along horizontal direction by H-shift control. The horizontal size, east/west, trapezoid corrections are obtained by varying the supply voltage of H-deflection circuit via buck converter, seven capacitors plus power MOSFET switches and DC controlled linearity coil are designed for optimal screen horizontal linearity.

VERTICAL DEFLECTION:

The majority of vertical deflection function is integrated by two ICs: TDA4856 and STV9379.

The TDA4856 takes care of sync polarity correction, automatic catching and holding of the vertical oscillator, to generate saw-tooth drive current for vertical output, C and S correction, the other hand, it also generates a correct V-blanking pulse for video blanking during vertical retrace interval.

The STV9379 -- a DC-coupled vertical deflection booster and driving by differential input is suitable for CRT color monitor, the output stage with thermal, soar protection, and high linear saw-tooth signal amplification to obtain the required and reliable vertical deflection current.

EHT GENERATOR

The IC L5991A is used as EHT controller to generate required extra high voltage for CRT anode, the line output transformer (LOT) transfers the voltage to required anode voltage and rest tertiary output voltage. The adjustable focus G3, G4 and screen G2 voltages are internally derived from the anode voltage, other secondary windings are used to generate required voltages for G1 and spot killer used. For safety reasons, x-ray protection circuit is included in L5991A which will shut down EHT generator if the anode voltage exceeds a certain value (29kV), the other hand, over beam current protection is also available by combination of two small transistors and several resistors, diode and capacitor, it will sense the beam current from ABL circuit and activate the soft start of L5991A to decrease EHT in case the total beam current exceeds specified value.

B. VIDEO AMPLIFIER & DDC2B

VIDEO AMPLIFIER:

The video circuit mainly consists of pre-amplifier TDA4887, LM2412, post amplifier and DC restoration circuit, the video DC level and gain at cathode is controlled via I2C bus & software.

The red, green and blue video signals are amplified by pre-amplifier and post-amplifier, then AC couple to next stage - DC restoration circuits, there are three cut-off adjustments are provided in this stage to set necessary video black level at cathode for all three guns. In addition cut-off, three individual gain adjustments at pre-amplifier are used to adjust required color point (white balance), both cut-off and gain control are digital control via I2C bus.

A spot-killer circuit is built in to prevent the CRT damage due to spot burn out when the set is switched off.

DDC 2B:

Via external DDC_SCL, DDC_SDA and internal SDA and SCL, the information about the monitor, including the serial number, production Codes, CRT type and applicable timings, - - - are stored in the

EEPROM as EDID of Data Display Channel, this EEPROM is also used to store all factory setting like H-size, H-shift, V-size, V-shift, - - - etc.

A. PURITY AND CONVERGENCE CONTROL

There are four corner coils defined as purity coils and installed around the CRT, these coils are driven by four DC amplifiers respectively, they provide the purity correction via digital control, the temperature compensation is also available for environment and funnel temperature changed.

The static convergence coils (4H/4V coil) are combined with deflection yoke, the other two DC amplifiers are used to drive the 4H/4V coil via digital control to provide end-user static convergence control function.

E. MICRO-CONTROLLER

GENERAL DESCRIPTION:

The Weltrend ET62P2 micro-controller is used to control all required functions of monitor and store all necessary data in EEPROM M24C16, the most important thing is that "interrupt" is used to detect mode change very fast, then request the MCU to execute protection behavior for horizontal output transistor free from high transient pulse during mode change.

HARDWARE DEFINITION:

a) KEY BOARD

There are five keypads at the front of monitor for the OSD control.

- OSD function key:

- Enter

Depress it to enter or exit the OSD window

- UP

To select the parameters which are shown at OSD window.

- DOWN

To select the parameters which are shown at OSD window.

- RIGHT (+)

To adjust the parameter to right or up side which is chosen from OSD window.

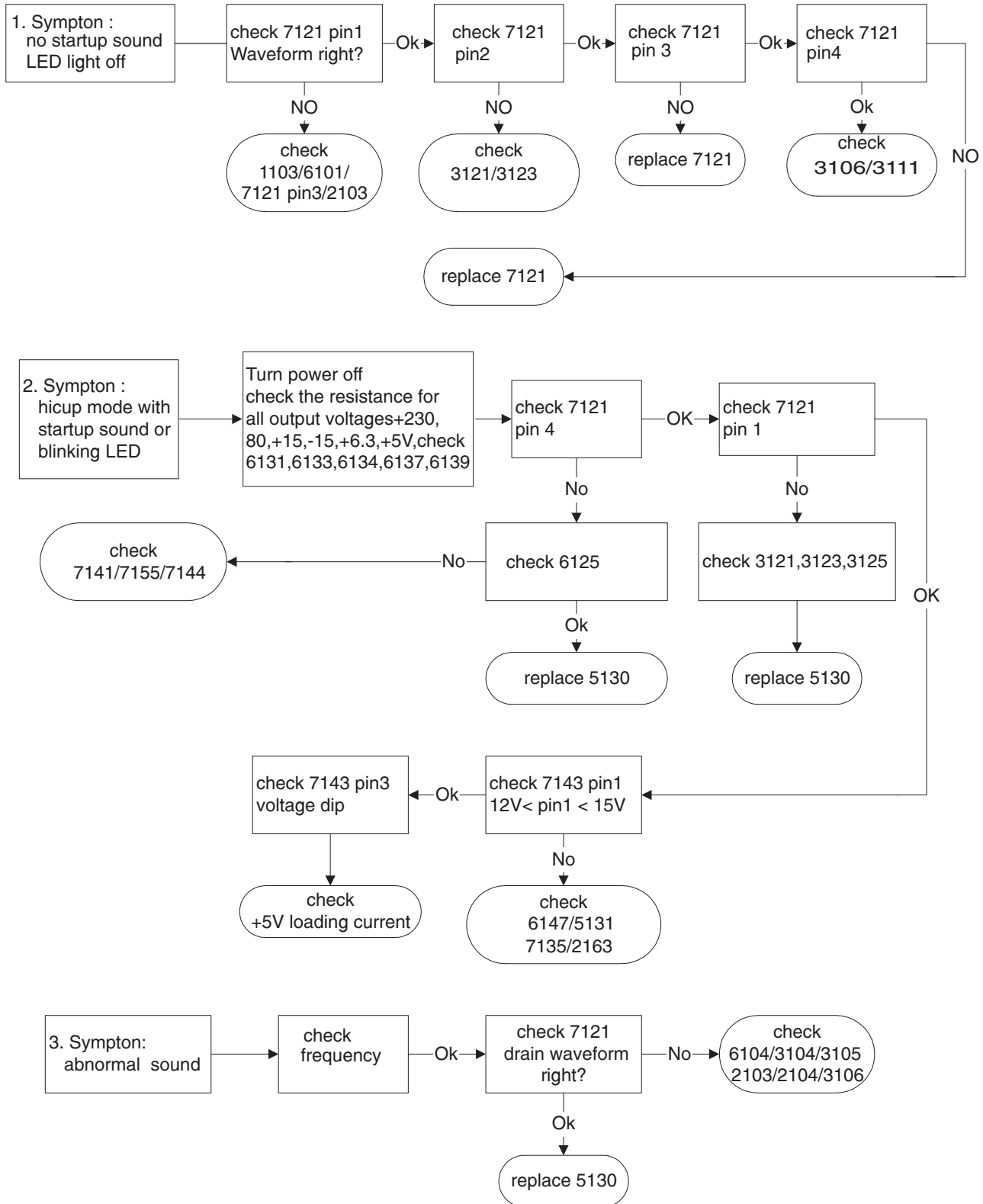
- LEFT (-)

To adjust the parameter to left or down side which is chosen from OSD window.

OSD window will disappear and save all setting after 30 seconds.

Repair Flow Chart

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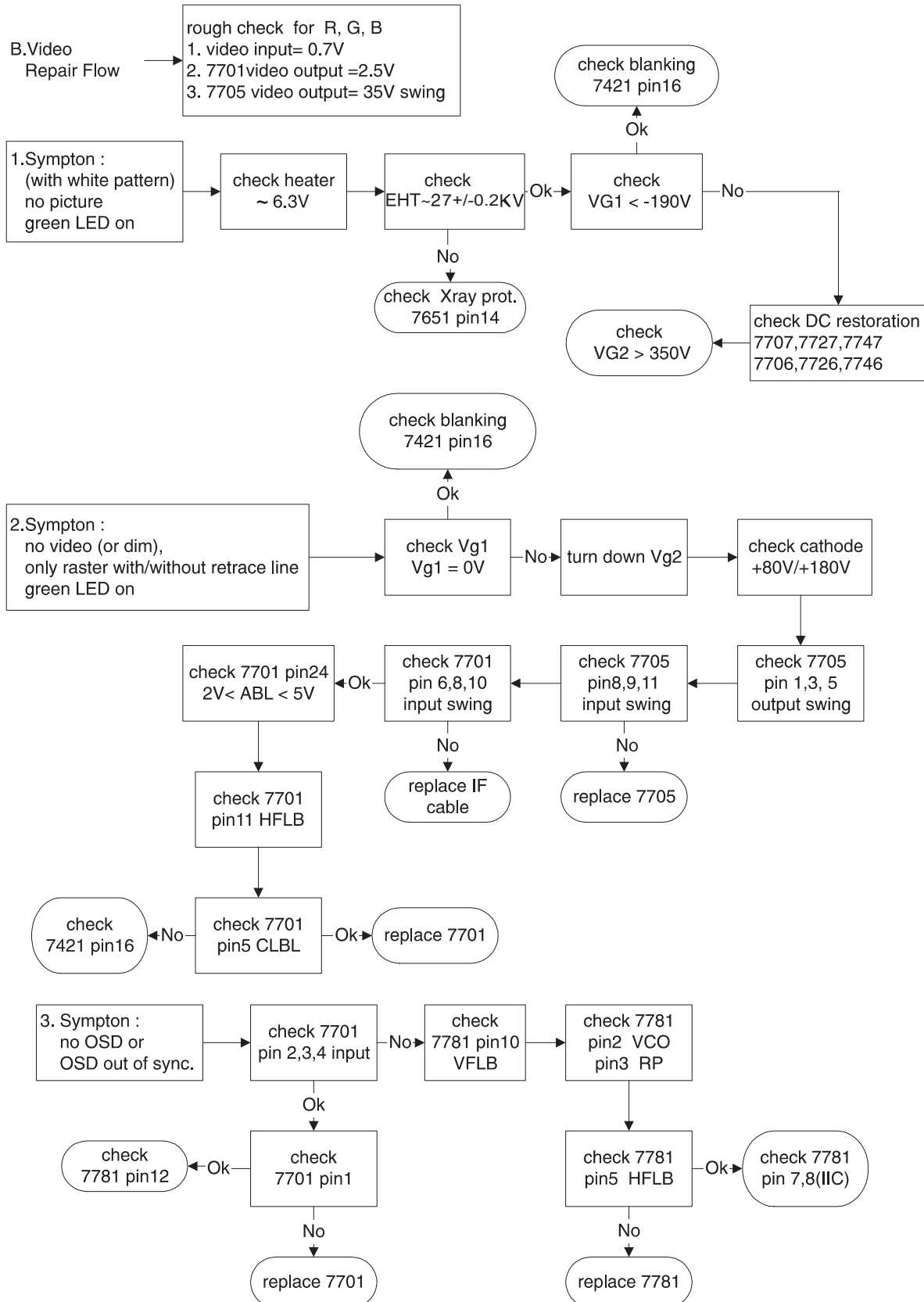


Repair Flow Chart

Dell P1230 M25P

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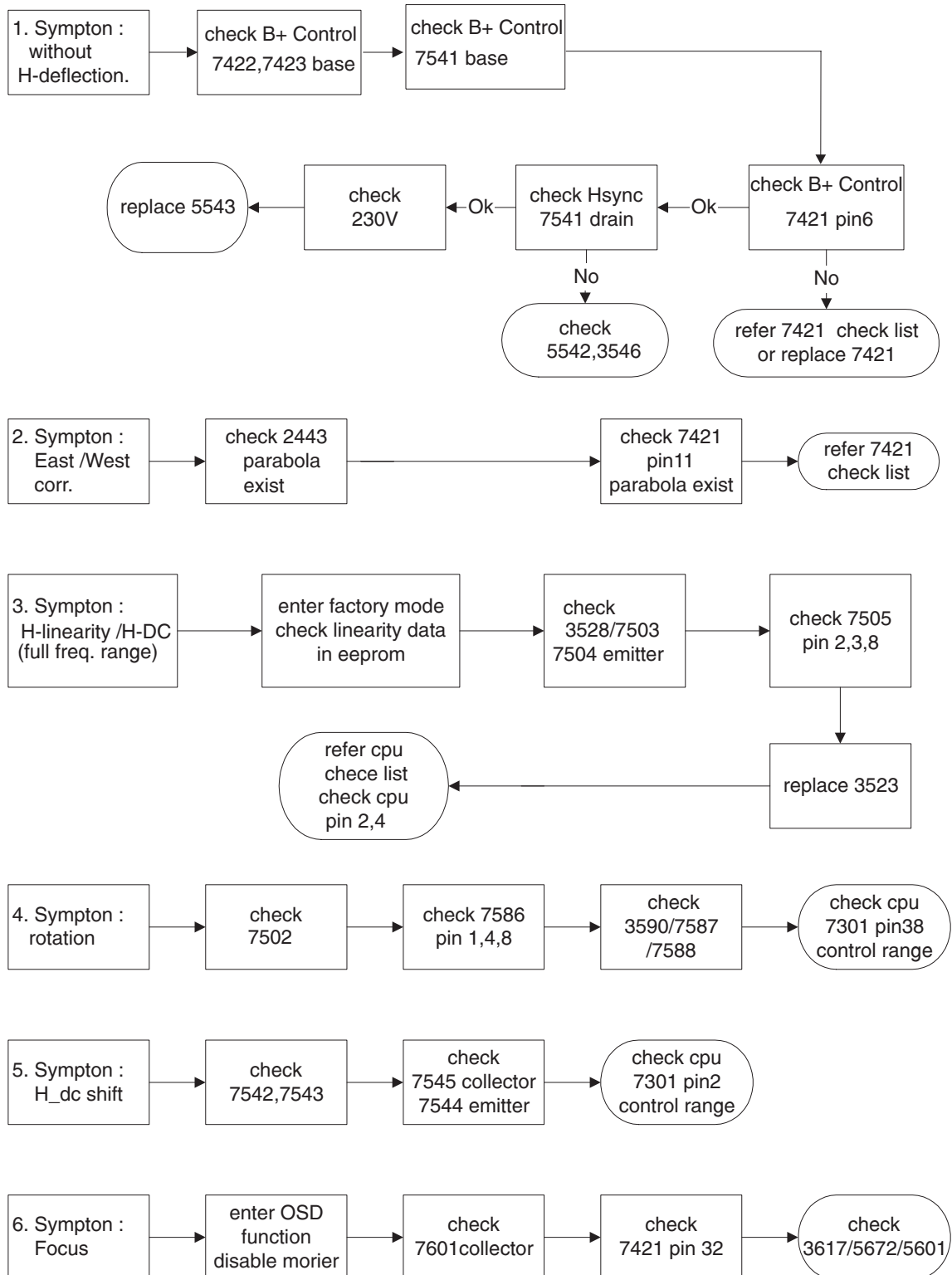
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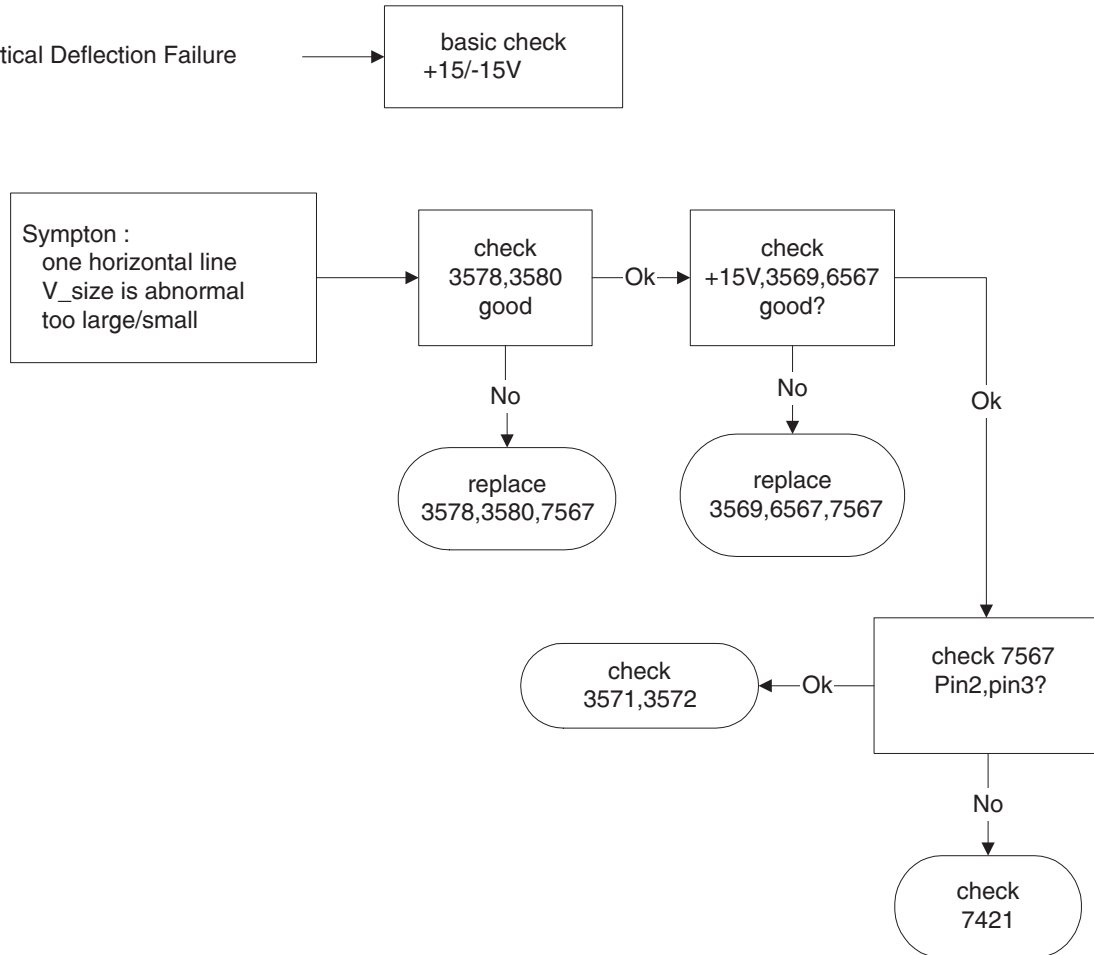
Repair Flow Chart

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C. Horizontal deflection
output repair flow :

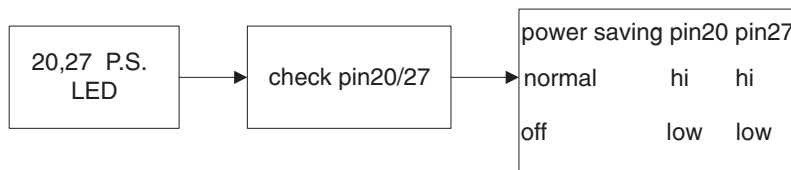
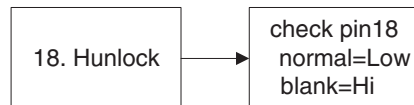
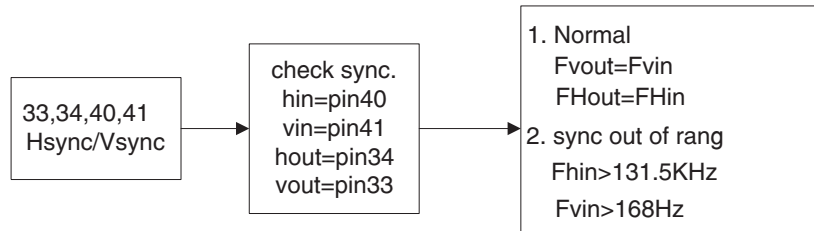
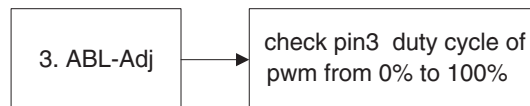
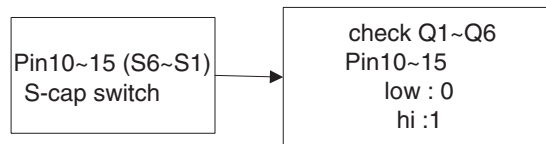
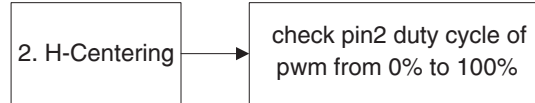
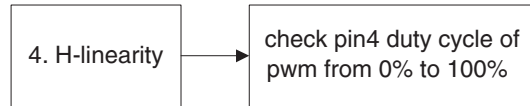
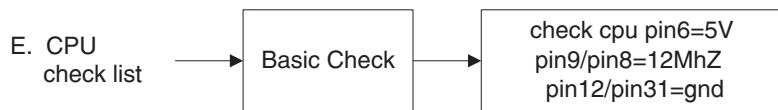


D. Vertical Deflection Failure



Repair Flow Chart

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202P130K S-CAPACITOR SWITCH TABLE

Hor. Freq.(KHz)	Q7	Q6	Q5	Q4	Q3	Q2	Q1
~33.00	1	1	1	1	1	1	1
33.00~36.00	0	1	1	1	1	0	1
36.00~42.00	1	0	1	1	0	0	1
42.00~45.00	1	0	1	1	1	1	0
45.00~47.50	0	1	0	0	1	1	0
47.50~49.00	0	1	1	1	0	1	0
49.00~52.00	0	0	0	1	0	1	0
52.00~55.00	1	0	1	0	0	1	0
55.00~58.50	0	1	0	0	0	1	0
58.50~61.50	1	1	0	1	1	0	0
61.50~65.00	1	1	1	0	1	0	0
65.00~70.00	0	0	1	0	1	0	0
70.00~73.00	1	0	0	0	1	0	0
73.00~76.00	0	1	1	1	0	0	0
76.00~80.60	1	0	1	1	0	0	0
80.60~82.50	1	1	0	1	0	0	0
82.50~84.80	0	1	0	1	0	0	0
84.80~88.50	1	0	0	1	0	0	0
88.50~92.50	0	0	0	1	0	0	0
92.50~98.00	1	1	1	0	0	0	0
98.00~102.00	0	1	1	0	0	0	0
102.00~110.00	1	0	1	0	0	0	0
110.00~113.50	1	1	0	0	0	0	0
113.50~122.00	0	1	0	0	0	0	0
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126.50~	0	0	0	0	0	0	0

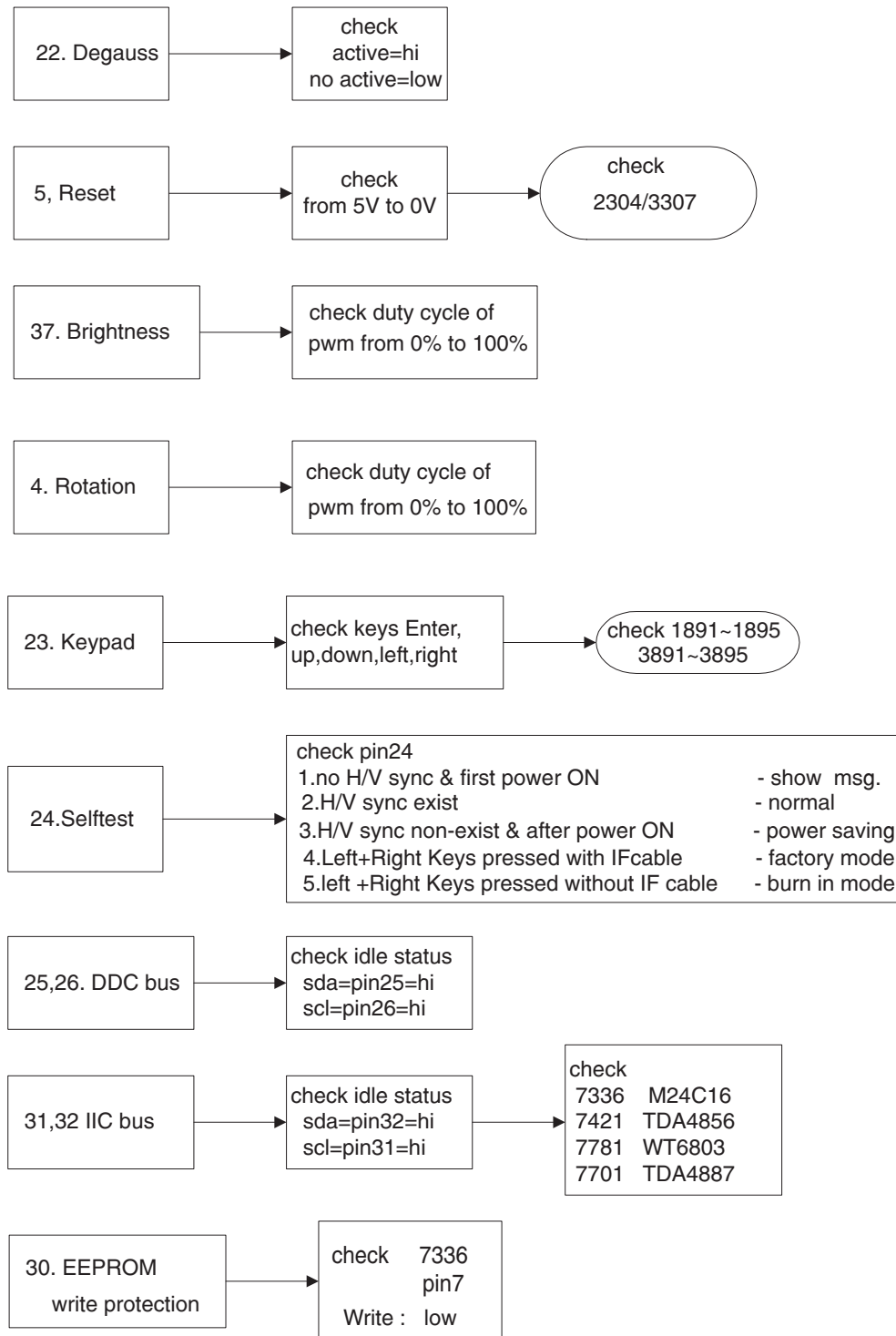
note: bit0→Q1, bit1→Q2, bit2→Q3, bit3→Q4, bit4→Q5, bit5→Q6, bit6→Q7
Q1: Scapacitor1, Q2: Scapacitor2, Q3: Scapacitor3, Q4: Scapacitor4, Q5: Scapacitor5,
Q6: Scapacitor6, Q7: Scapacitor7

Repair Flow Chart

Dell P1230 M25P

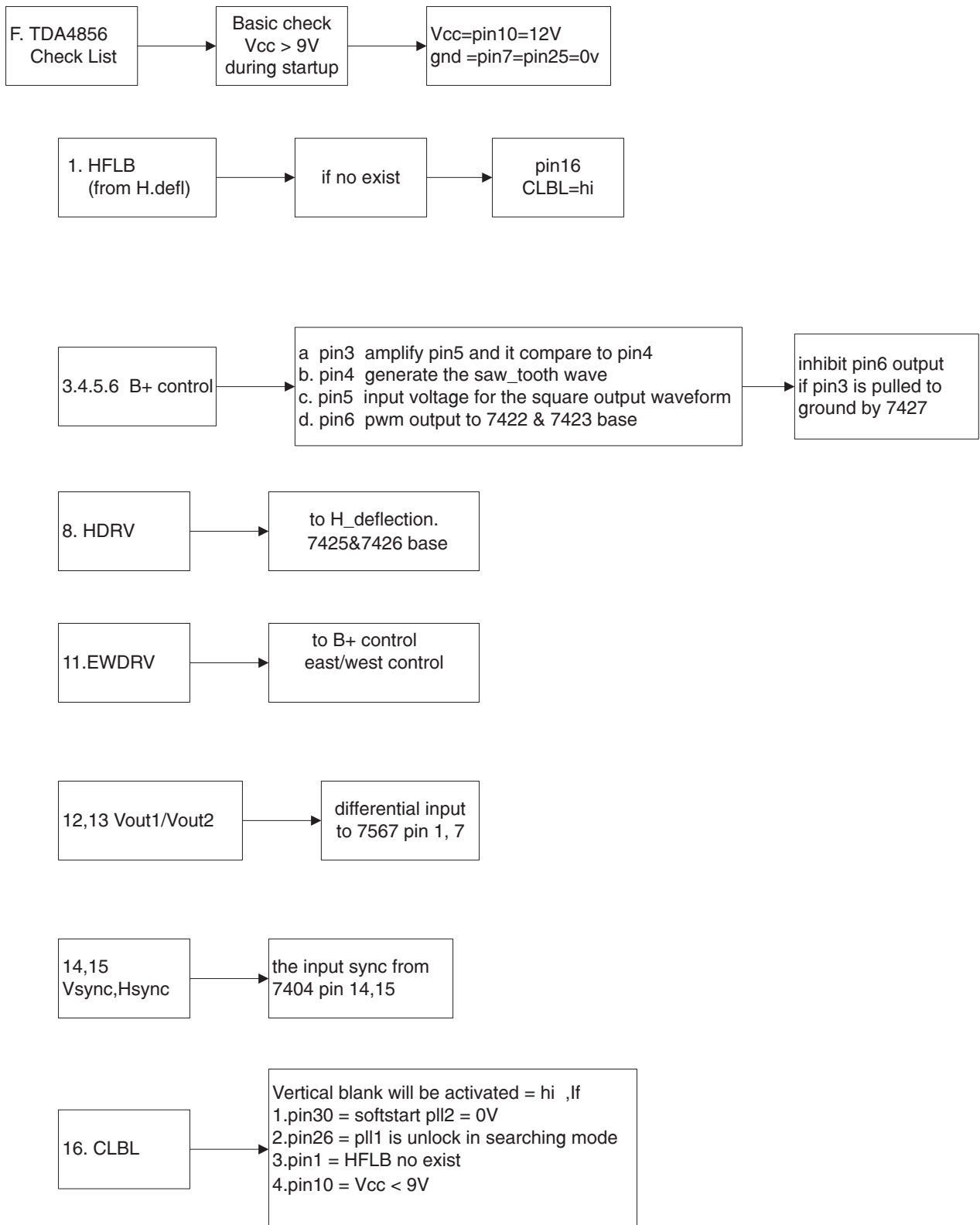
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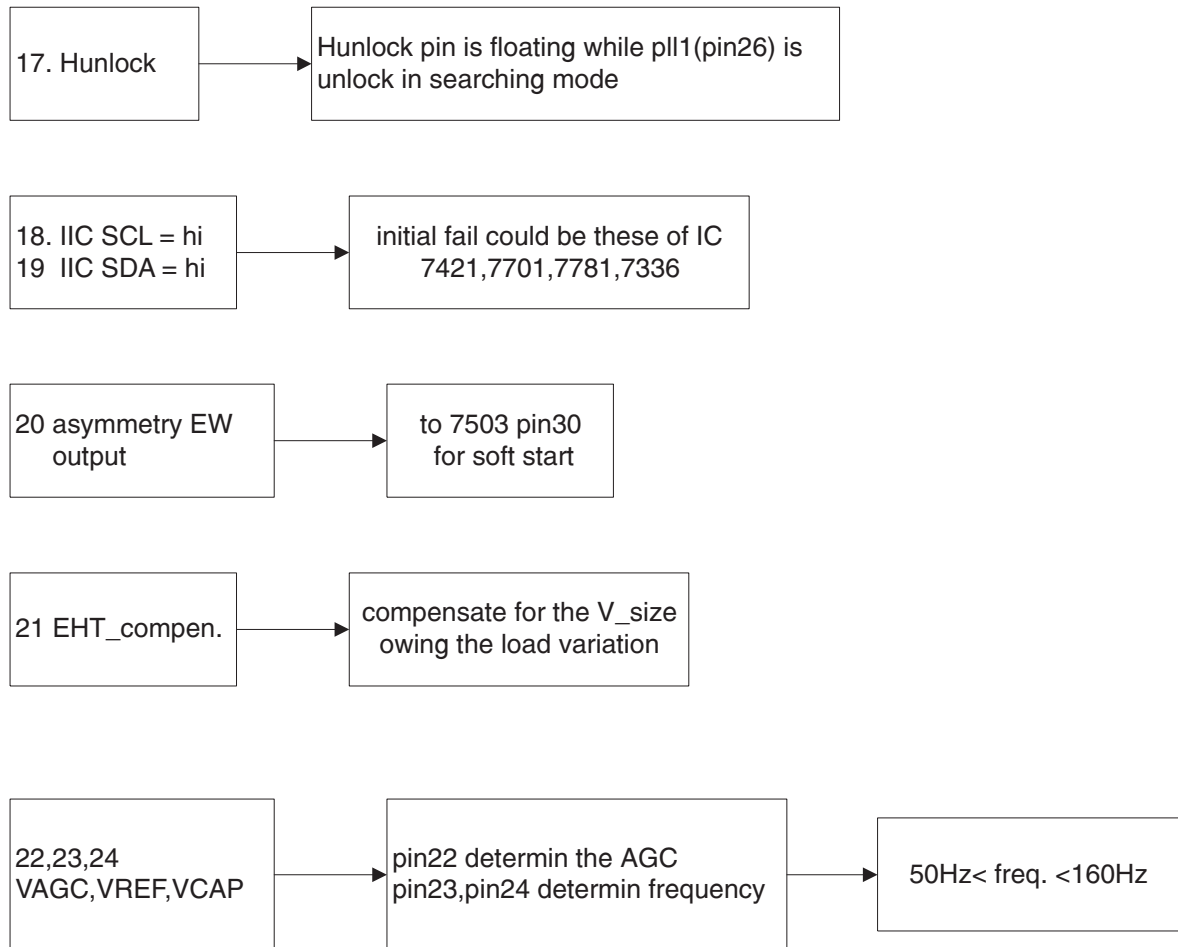
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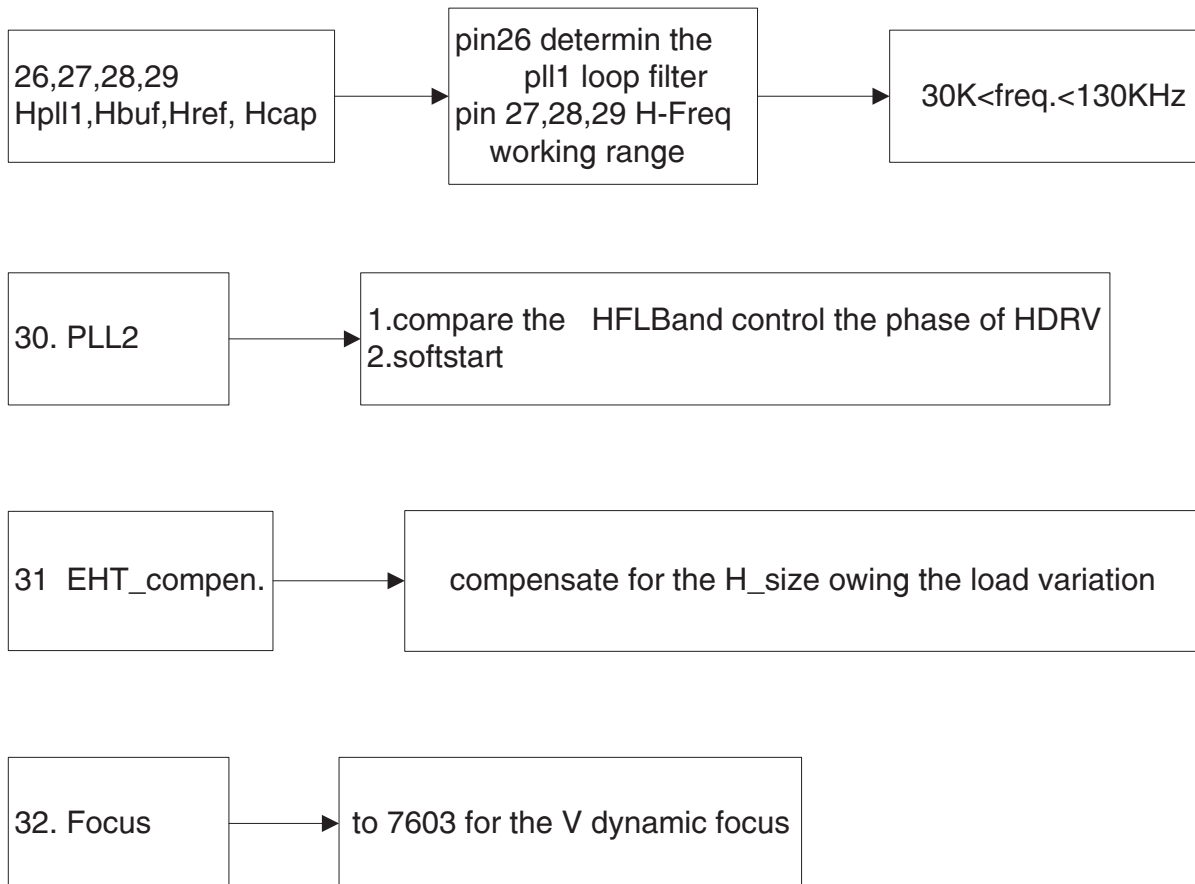
Repair Flow Chart

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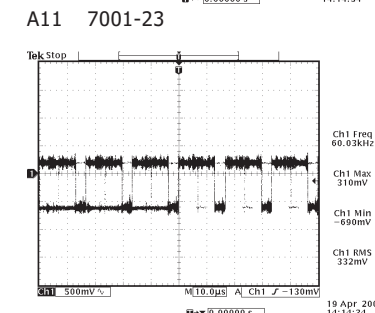
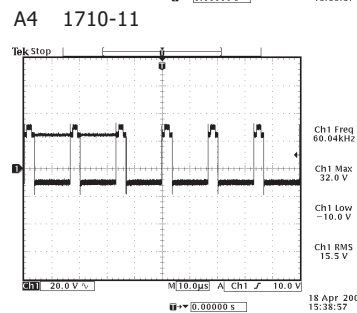
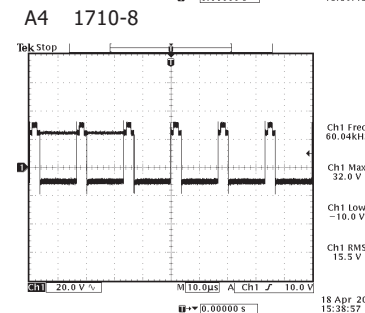
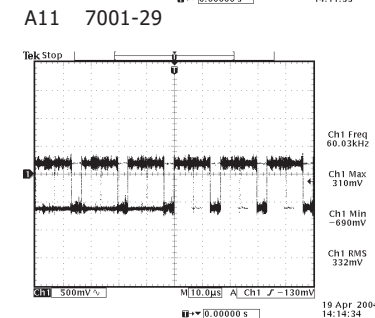
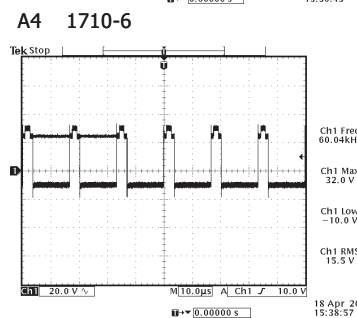
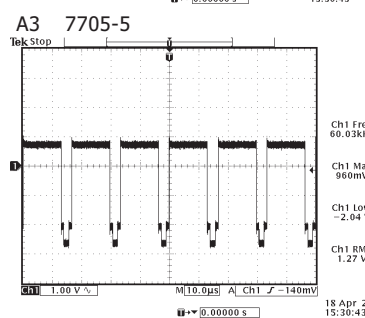
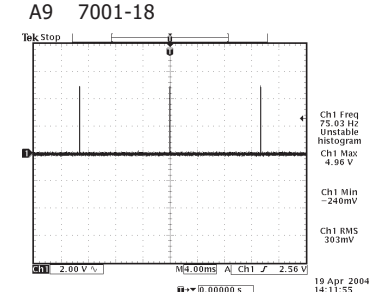
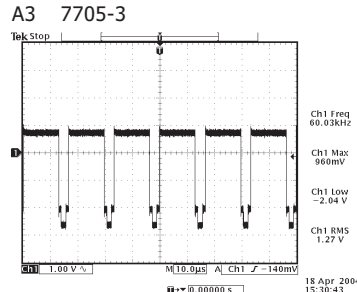
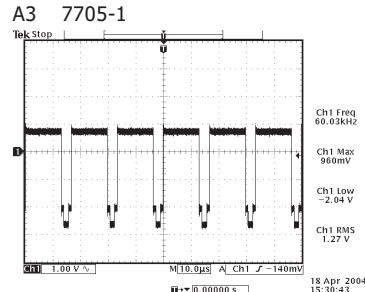
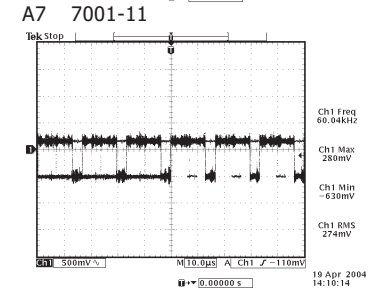
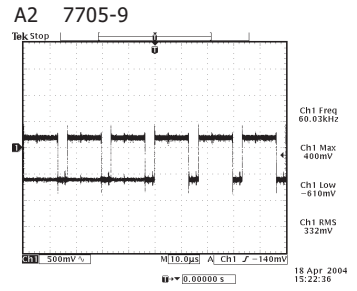
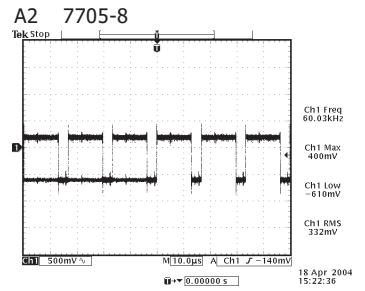
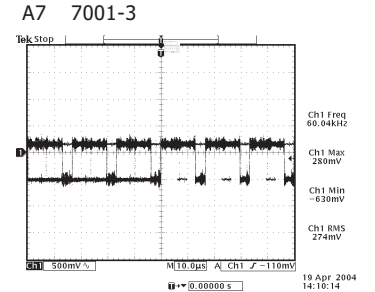
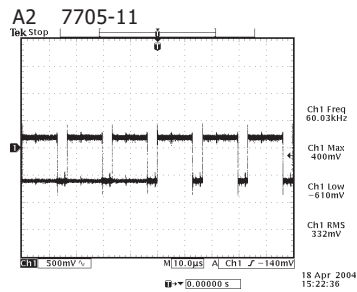
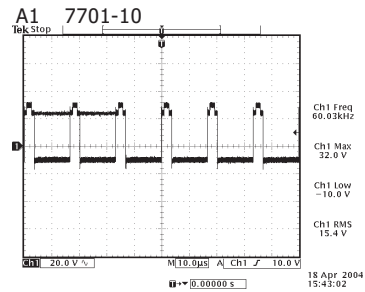
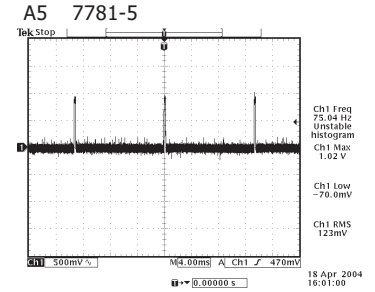
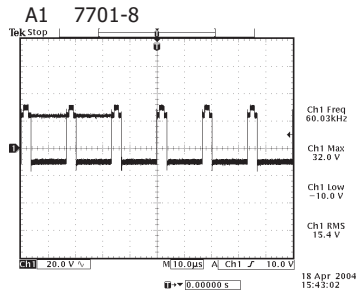
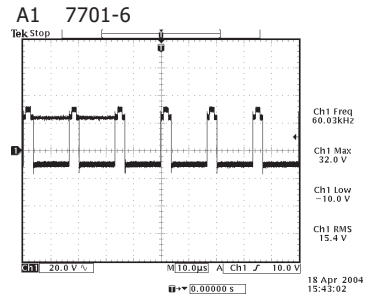




Repair Flow Chart

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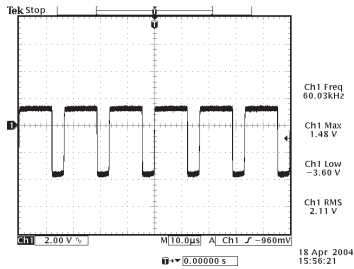
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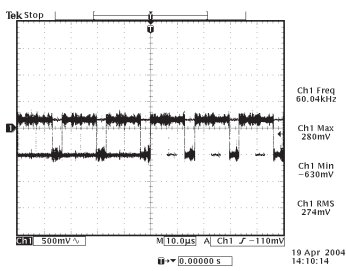
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(B)

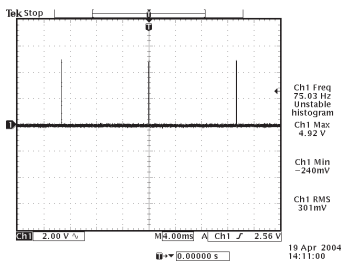
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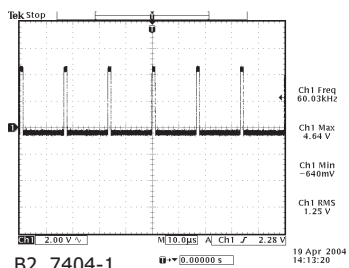
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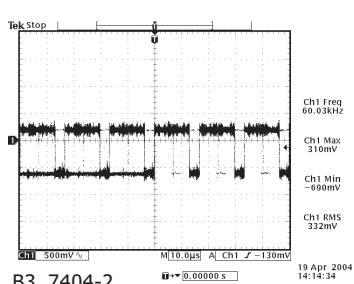
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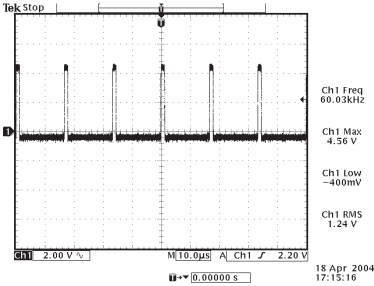
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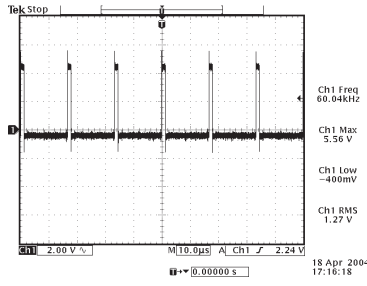
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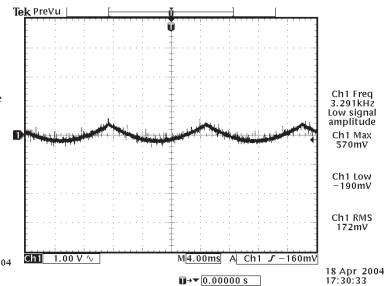
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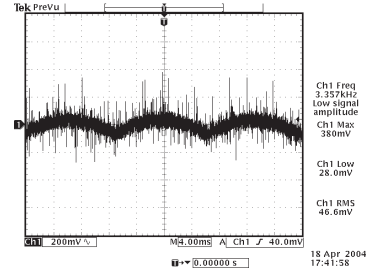
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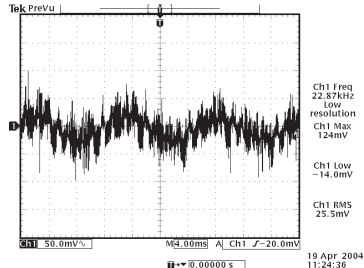
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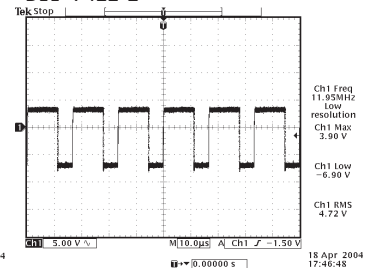
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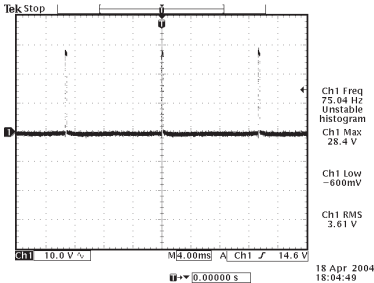
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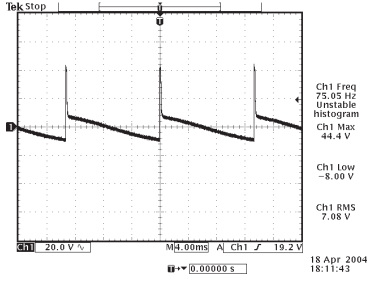
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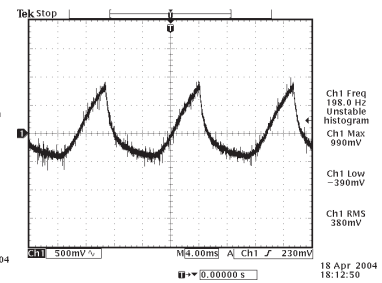
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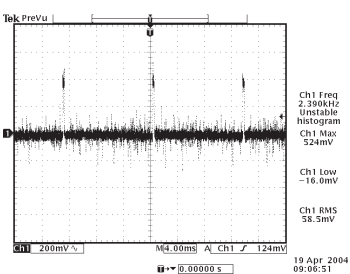
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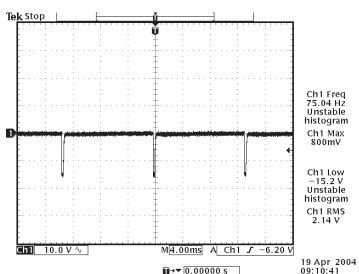
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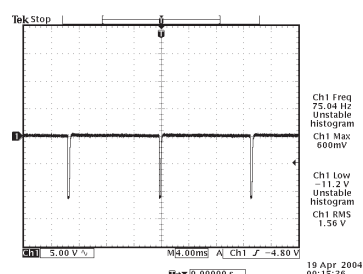
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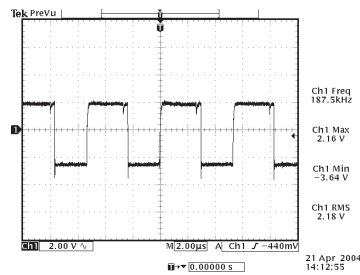
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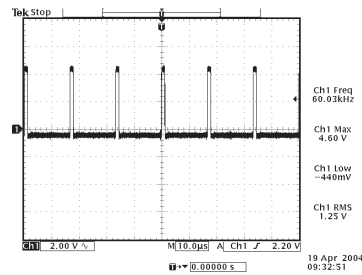
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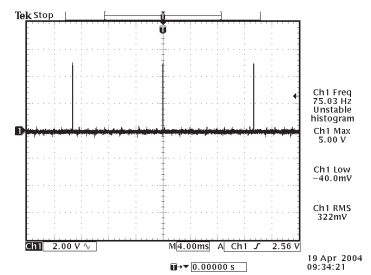
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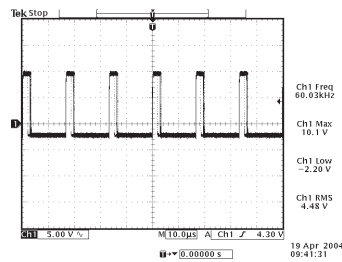
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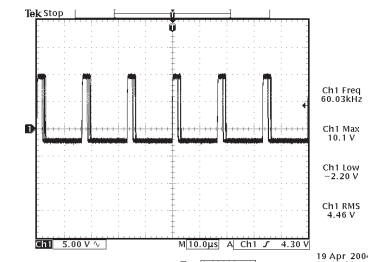
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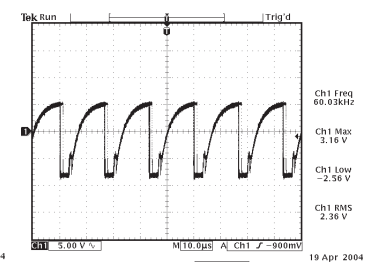
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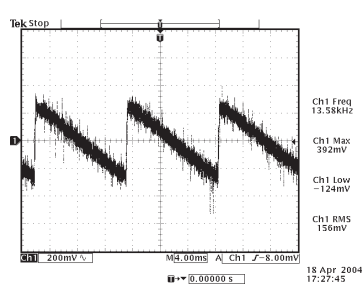
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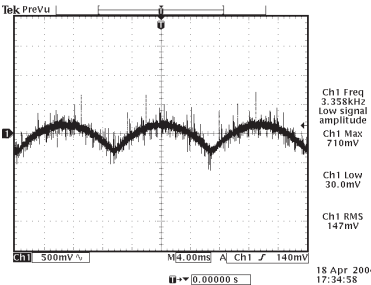
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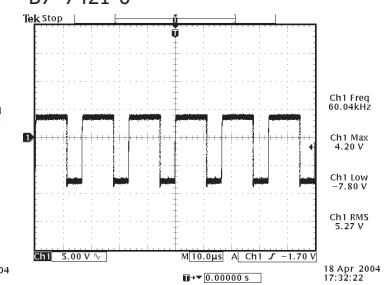
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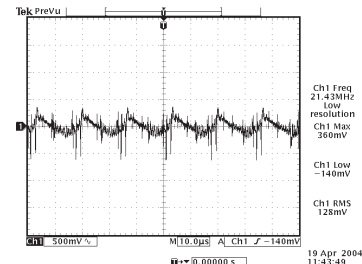
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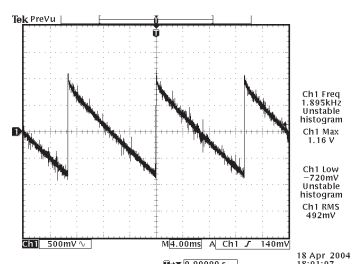
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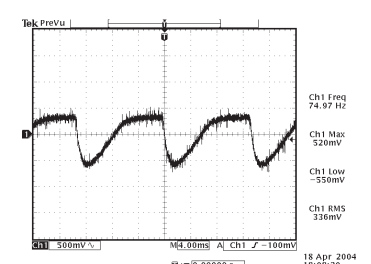
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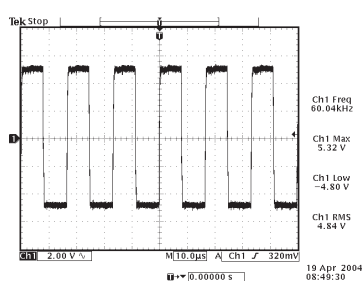
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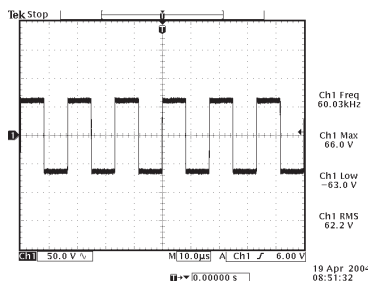
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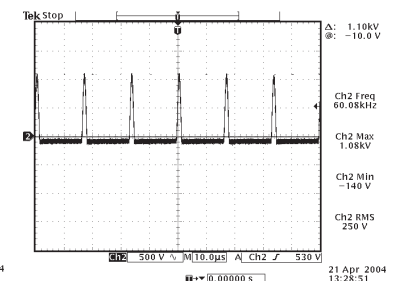
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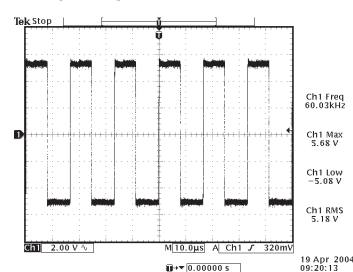
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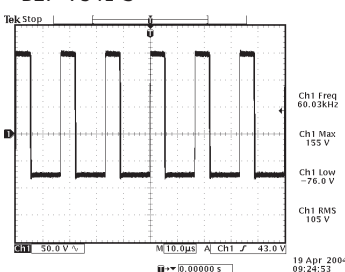
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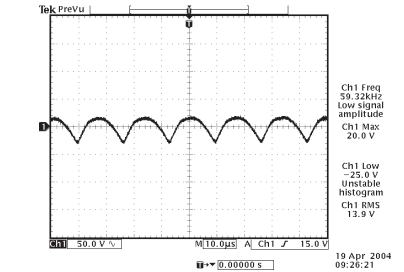
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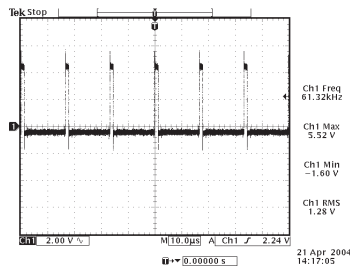


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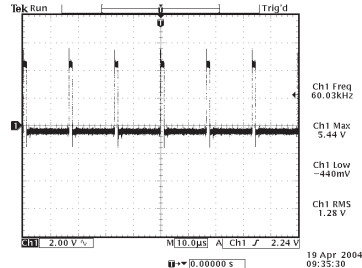


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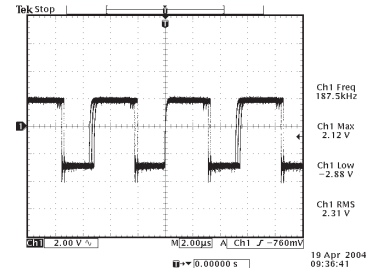
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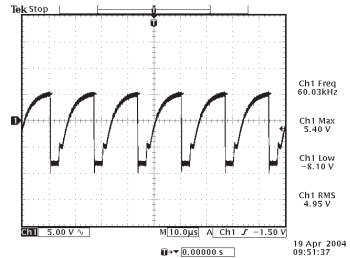
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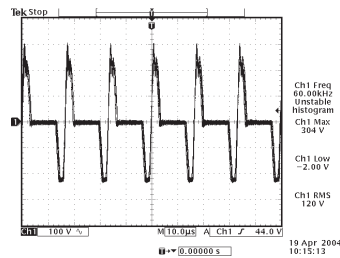
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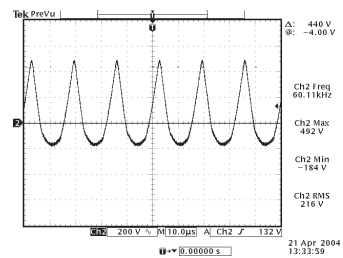
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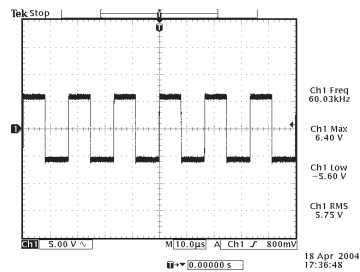
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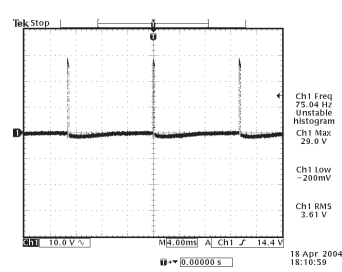
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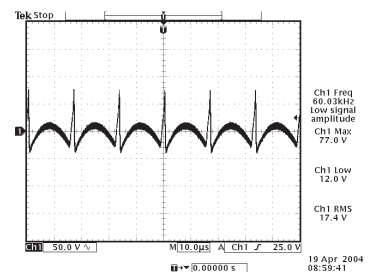
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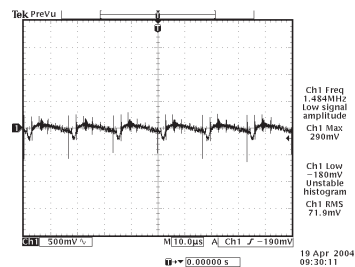
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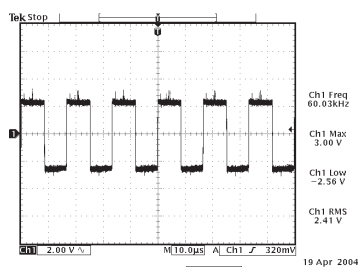
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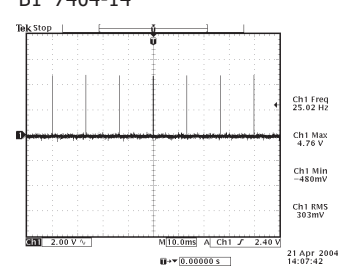
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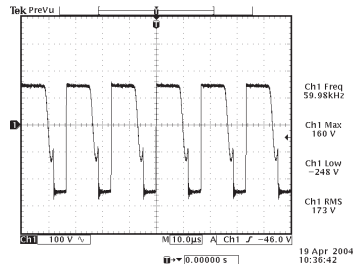
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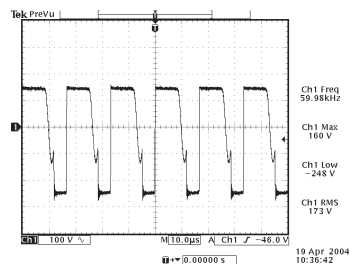
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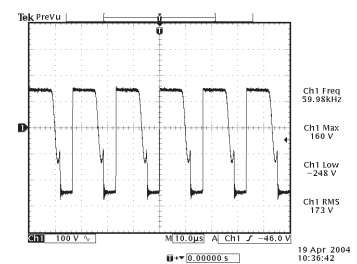
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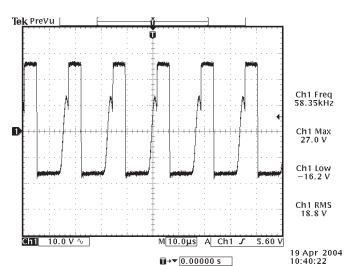
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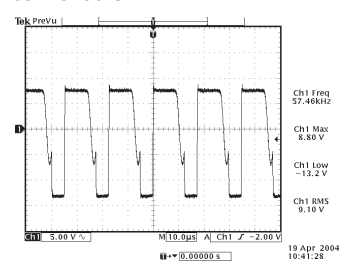
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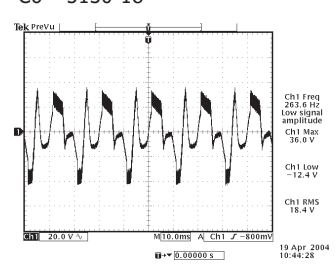
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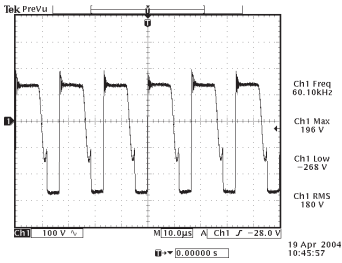


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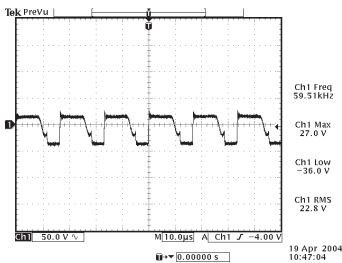


(C)

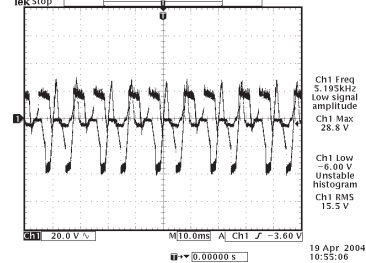
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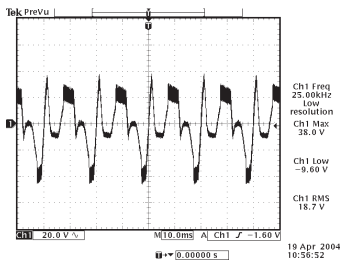
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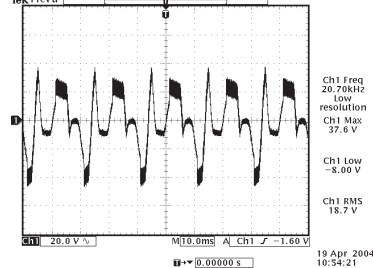
C9 7122-B



C10 7122-E



C11 7122-C



TELEVISION/MONITOR SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous service may have left an unsafe condition, which could be unknowingly passed on to your customer. Be sure to check all of the following:

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed in accordance with the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with an asterisk (*) in the parts list and enclosed within a broken line (where several critical components are grouped in one area) along with the safety symbols on the schematic diagrams and/or exploded views.
7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug.) Defeating this safety feature may create a potential hazard to the service and the user. Extension cords which do not incorporate the polarizing feature should never be used.
9. After reassembly of the unit, always perform a leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc. to be sure the unit may be safely operated without danger of electrical shock.

* Broken line

Implosion

1. All picture tubes used in current model receivers are equipped with an integral implosion system. Care should always be used, and safety glasses worn, whenever handling any picture tube. Avoid scratching or other wise damaging the picture tube during installation.
2. Use only replacement tubes specified by the manufacturer.

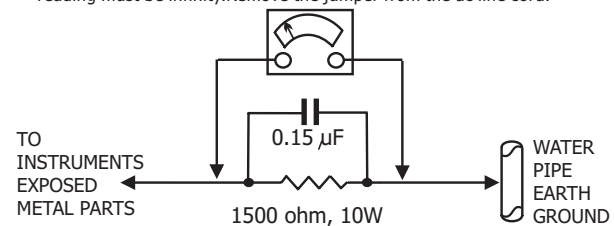
X-radiation

1. Be sure procedures and instructions to all your service personnel cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the high voltage at the factory recommended level.
2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturer's specified anode connectors must be used.
3. It is essential that the service technician has an accurate HV meter available at all times. The calibration of this meter should be checked periodically against a reference standard.
4. When the HV circuitry is operating properly there is no possibility of an X-radiation problem. High voltage should always be kept at the manufacturer's rated value - no higher - for optimum performance. Every time a color set is serviced, the brightness should be run up and down while monitoring the HV with a meter to be certain that the HV is regulated correctly and does not exceed the specified value. We suggest that you and your technicians review test procedures so that HV regulation are always checked as a standard servicing procedure, and the reason for this prudent routine is clearly understood by everyone. It is important to use an accurate and reliable HV meter. It is recommended that the HV recorded on each customer's invoice, which will demonstrate a proper concern for the customer's safety.
5. When troubleshooting and making test measurements in a receiver with

6. New picture tubes are specifically designed to withstand higher operating voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.
7. It is essential to use the specified picture tube to avoid a possible X-radiation problem.
8. Most TV receivers contain some type of emergency "Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode. These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.
2. Connect a 1.5k, 10w resistor paralleled by a 0.15uf. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms voltage sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 milliamps. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed. (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

Picture Tube Replacement

The primary source of X-radiation in this television receiver is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement tube must be the same type as the original, including suffix letter, or a Philips approved tube.

Parts Replacement

Many electrical and mechanical parts in Philips television sets have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part shown in this service manual may create shock, fire, or other hazards.

WARNING: Before removing the CRT anode cap, turn the unit OFF and short the HIGH VOLTAGE to the CRT DAG ground.
SERVICE NOTE: The CRT DAG is not at chassis ground.

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